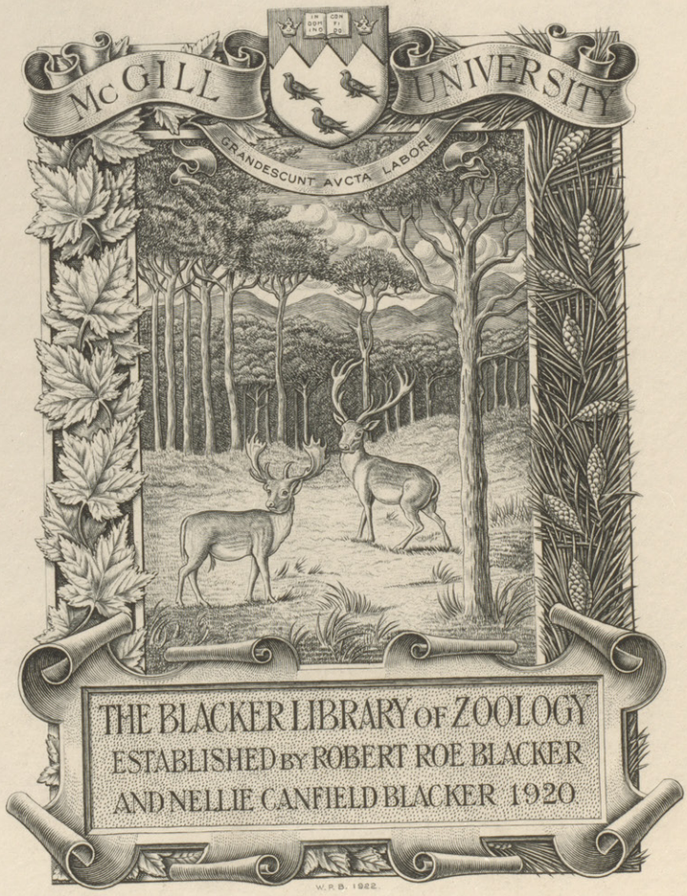
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AN INTRODUCTION TO THE LITERATURE OF VERTEBRATE ZOOLOGY

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BLACKER LIBRARY OF ZOOLOGY

Aquarelle attributed to Charles Collins (*ca.* A.D. 1736) of the Dodo, *Raphus cucullatus*. Original drawing from the Taylor White Collection in the Blacker Library of Zoology, McGill University, Montreal, Canada.

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AN

INTRODUCTION TO THE LITERATURE

OF

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BASED CHIEFLY ON THE TITLES IN THE

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THE EMMA SHEARER WOOD LIBRARY OF ORNITHOLOGY

THE BIBLIOTHECA OSLERIANA

AND OTHER LIBRARIES OF

McGILL UNIVERSITY, MONTREAL

COMPILED AND EDITED

BY

CASEY A. WOOD, M.D., LL.D.

Collaborator, Division of Birds, Smithsonian Institution

OXFORD UNIVERSITY PRESS

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BLACKER LIBRARY OF ZOOLOGY

Aquarelle attributed to Charles Collins (*ca.* A.D.1736) of the Dodo, *Raphus cucullatus*. Original drawing from the Taylor White Collection in the Blacker Library of Zoology, McGill University, Montreal, Canada.

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CATALOGUE PREFACE.

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This Introduction and Catalogue will not notice to any extent the literature of veterinary medicine or surgery, of anthropology, microscopical anatomy, biochemistry, zoological cytology, pathology, physiology, specific morphology, microbiology, experimental biology, experimental psychology, serology, vitalism, Mendelism nor systematic natural philosophy apart from vertebrate zoology. The Compiler knows that all these subjects interest (or should interest) the student but he has at his disposal neither the time nor the space required for even a partial catalogue or review of the extensive literature.

Although the Introduction and Index of the present volume deals almost exclusively with the literature of vertebrate zoology, most of the titles in natural history shelved in the Blacker Library and allied departments of the University, have been published - for purposes of reference. Moreover, it must be remembered that many titles apparently covering only botanical, geological or invertebrate zoological subjects discuss also important topics connected with studies of interest to the investigator in vertebrate zoology.

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PREFACE

After nearly six years of effort on the part of the Officials of the Libraries and Zoological Departments of McGill University the Compiler and Editor of the present treatise has prepared for the press a couple of volumes that are intended to assist students of vertebrate zoology and its bibliography, as well as University and other librarians, in securing a fair knowledge of an important branch of natural science. Although the parties to the present compilation are not altogether satisfied with the work - which is necessarily an incomplete presentation of the subject - it is hoped that it may serve as a sort of stop-gap until other hands have written and published a complete study and evaluation of all vertebrate literature - a consummation devoutly to be wished.

As will be seen from the Table of Contents the present compilation is divided into three distinct and yet closely related sections. Section A reviews the literature of vertebrate zoology, so far as it is represented in McGill libraries, from the earliest times to the year 1930.

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Section B furnishes a convenient, short-title index of the same literature (including its serials and periodicals), arranged geographically and in chronologic order, so that the student or librarian may recognise and locate in a few minutes any ordinary treatuse or periodical and many of the rare titles of zoological importance. Suppose, for example, that the book desired be a recent work on the vertebrate animals of Southern Mexico. The major headings, General Works. Middle America, are soon found and casting one's eye towards the end of the list the date and name "1908. Gadow, Hans" are at once perceived. Further information about the book, its whereabouts, etc., are easily obtained by consulting the appended Catalogue or the Catalogue of the British Museum (Nat. Hist.).

Section C, the largest of the three, is the (partially) annotated Catalogue of the printed books, periodicals, independent tractates, original drawings, manuscripts, etc. in the Blacker and other zoological collections of McGill, to which have been added a few titles of importance "on order" but not yet acquired at the date of going to press. These constant acquisitions also embrace many titles not referred to in this treatise.

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It will from the foregoing description be evident that the schemata of the present volume involves - indeed adopts - the principle of repetition; in the text to follow the Compiler occasionally (and deliberately) repeats not only the name of an author but the titles of his writings and even an account of his career when and where he thinks it desirable to fix important facts in the mind of the student.

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¶ The main sources of the information to be found in this volume are (first and foremost) the ~~magnificent~~ Blacker Library of Zoology, the Emma Shearer Wood Library of Ornithology, the Osler Library of the History of Medicine, the Gest Library of Chinese Literature and the general library of the University.

The Blacker Library of Zoology was founded in 1920 and, later, handsomely endowed through the munificence of Mr. Robert Roe Blacker and his wife Nellie Canfield Blacker of Pasadena, California. ¶ Mr. Blacker was born in Canada, and in migrated to Michigan to engage in the lumber business. There he married, and in retired from business to settle in Pasadena where he and Mrs. Blacker have continued to reside. These two widely known and highly respected citizens have for many years been engaged in various philanthropic works. They have ~~certainly~~ shown themselves good friends of scientific research, especially in ~~several~~ donations to McGill University and to the California Institute of Technology. Residing in the neighborhood of the latter school of learning they have been closely identified with its many activities and have given much of their time,

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the first draft of a "Catalogue and
Extract from "Introduction to the Literature of Vertebrate Zoology.".

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About two-thirds of the titles listed in the appended Catalogue are shelved in the stacks of the Blacker Library, and it now ranks among the large collections of zoological literature in America. The endowment furnished by the donors is sufficient for the continuation of the many zoological serials and periodicals now in progress and for the yearly addition of the most important new publications on vertebrate zoology. A more detailed account of rarities, such as original drawings, and other unique periodical series, not to mention scarce and fundamental treatises (of which this library has a goodly share) will be found in the various chapters of the present volume.

The aim of the founders of the Blacker Library is to furnish a supply of literary material that will meet the varied wants of a University in which not only the student body, but research scholars, librarians and the public generally may consult quickly nearly every work on zoology likely to interest them.

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The Emma Shearer Wood Library of Ornithology, begun several years prior to the installation of the Blacker collections, forms a sort of supplement to the latter. It was founded in the name of a lady who, although (through her husband) an American citizen, was born in Montreal. As the Shearer family of Montreal have always been closely identified with the life of McGill, it seemed appropriate that this collection should form part of the University library.

The E.S.W. Library was originally intended to furnish as nearly as possible complete sets of periodicals and serials devoted to bird-life many of which, as is well known to collectors, are out of print and have always been difficult to acquire. Consequently it happens that the library is particularly rich in these fundamentals, so necessary to research in ornithology. In addition, the collections shows the usual (and many unusual) titles directly or indirectly bearing on the avifauna of the world in all the scientific and in several other languages. Arrangements for the acquisition of serial and periodical continuations have been made, as well as provision for the purchase of desirable treatises as they appear on the market.

Both the Blacker and E.S.W. Libraries are under the special care of Miss Elizabeth Abbott, a trained librarian working under the advice and guidance of the general director, Dr. Gerhard Lomer.

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¶ The following account of the Osler Library was written for the London Times by Dr. Charles Singer, a former associate of Sir William Osler in Oxford University. As the famous donor of the collection was born in Canada and once held the chair of Physiology in McGill it was an appropriate gift to that University:- ~~BIBLIOTHECA OSLERIANA. A Catalogue of Books Illustrating the History of Medicine and Science. Collected, Arranged, and Annotated by Sir William Osler, Bt., and Bequeathed to McGill University.~~

"Sir William Osler was all his life a book collector. During his later years much of his best energies were given to a favourite scheme for the formation of a library illustrating the history of medicine. It was always his intention that this should be presented to his alma mater, McGill University, Montreal. There his books have now been conveyed and his library has recently been opened to the learned public. Osler's scheme centred round what he called the 'Bibliotheca prima'. This was to include all the works of first class and historical importance in the advancement of medicine and the allied sciences. Under this heading he included about a hundred names. They were to be represented in each case by the first edition and by the most important subsequent editions, together with works illustrative of their history and reception. Grouped round the 'Bibliotheca prima' was a 'Bibliotheca secunda' and other bibliothecae classed as 'Litteraria', 'Historia', 'Biographica', 'Bibliographica',

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besides special collections of manuscripts and of fifteenth-century books.

"The library is not a very large one - the editors distinguish under 8,000 items - but it is undoubtedly put together with very fine and individual judgment, and forms the true reflex of its collector. There are a few obvious gaps which Osler would certainly have filled had his life been prolonged for even a few months. The pious feelings of the editors have, however, preserved the library as near as possible in the form in which he left it. The library contains about 126 books printed in the fifteenth century, many of great rarity. The manuscripts include a number of documents relating to Osler's own career and a group of oriental medical manuscripts [and printed books] presented to the library by Dr. Casey A. Wood. The preparation of this very full catalogue has occupied a large part of the time of the editors for some ten years. Apart from its other interests, the extreme patience and accuracy with which the book has been prepared render it a most valuable and, indeed indispensable bibliographical reference work. The three editors, Dr. W. W. Francis, now Librarian of the Osler Library at Montreal, Mr. R. H. Hill, of the Bodleian Library, and Dr. Archibald Malloch, Librarian of the New York Academy of Medicine, have performed their task with great skill and discretion. Their constant aim of fulfilling the wishes of Osler with exactness and completeness has, we believe, been attained."

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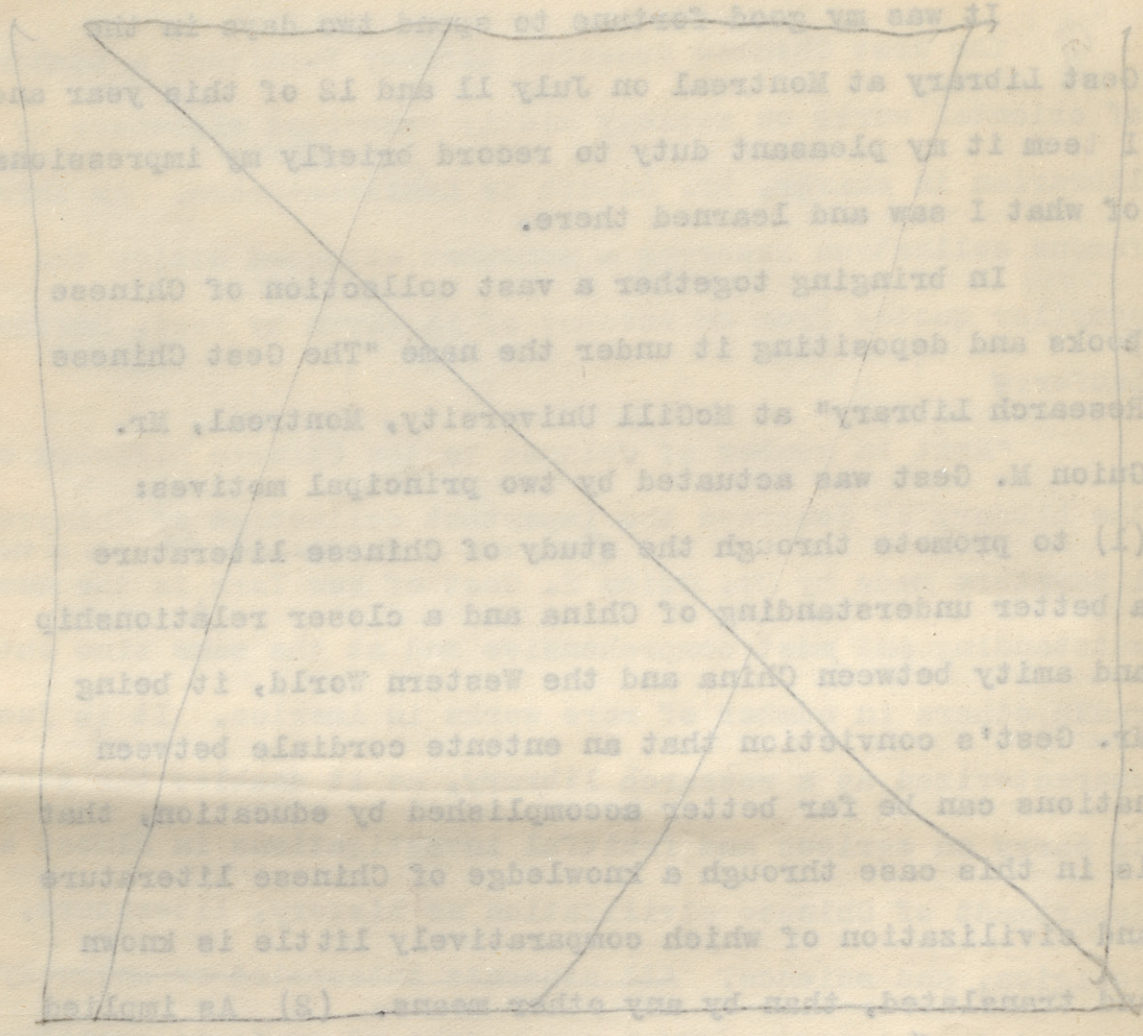
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(9) The Gest Chinese Research Library furnishes a number of oriental works on zoology kindly described elsewhere by the librarian in charge, Dr. Robert de Résillac-Roese. As this famous collection deserves a somewhat extended notice the compiler quotes from an account of it given by Prof. Berthold Laufer:

"Next in number of volumes to the Chinese Division of the Library of Congress the important collection of Chinese literature made by Mr. Guion M. Gest of New York [now one of the special libraries of McGill University] is the most outstanding and most comprehensive and at the same time outranks others in number of rare works in America. It is justly characterized as a research library, as it enables the student to carry on serious and fruitful investigations in almost any department of Chinese civilization as history, literature, religion, and science. ~~All students interested or actively engaged in Chinese research owe a debt of profound gratitude to Mr. Gest for his unselfish devotion to an ideal which he has pursued for many years of his life. Fascinated by Buddhism since the early days of his boyhood, he has maintained a steadily growing intelligent interest in the civilizations of the Far East and created a lasting monument which will be still more profoundly appreciated by future generations as the spiritual bonds connecting us with the Orient will grow more intense.~~

It was my good fortune to spend two days in the Gest Library at Montreal on July 11 and 12 of this year and I deem it my pleasant duty to record briefly my impressions of what I saw and learned there.

In bringing together a vast collection of Chinese books and depositing it under the name "The Gest Chinese Research Library" at McGill University, Montreal, Mr. Guion M. Gest was actuated by two principal motives: (1) to promote through the study of Chinese literature a better understanding of China and a closer relationship and amity between China and the Western World, it being Mr. Gest's conviction that an entente cordiale between nations can be far better accomplished by education, that is in this case through a knowledge of Chinese literature and civilization of which comparatively little is known and translated, than by any other means. (2) As implied by its name, The object of the Gest Library it to place its books at the disposal of scholars for research-work, especially in cooperation with the faculties of McGill and other universities, as well as with sinologists in the United States, Europe, China and Japan. Research-work of this character has already been done in medicine, pharmacology, astronomy, etc. A plan is on foot to found a chair for Chinese language and literature at McGill, which was



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chosen by Mr. Guion M. Gest because of the excellent and profound research-work accomplished in the different faculties and departments of this university.

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"The staff of the Gest Library is formed by Dr. Gerhard R. Lomer, University Librarian, and Dr. Robert de Résillac-Roese, who has immediate charge of the cataloguing and pursues his task with a rare zeal and enthusiasm. He is assisted in his work by Miss Swann, a good Chinese scholar, and by a scholar of Chinese nationality, who at present is Mr. Kwei. The library's collaborator in China is Mr. I.V. Gillis who resides in Peking and who has an extraordinary ability as a book-hunter. He was formerly naval attaché to the U. S. Legation of Peking.

"The Gest Library was informally opened in 1926 on the day of Chinese New Year, February 13th, with an asset of 304 large works consisting of 10,750 volumes. These had been selected by Mr. Ch'ên-Pao-Ch'ên, noted statesman and scholar, tutor of the last Manchu emperor, Hsuan Tung (1908-11). By June 30th, 1929, the collection had increased to a total of 2,054 titles consisting of 50,640 volumes,* All these works have been identified, catalogued, doubly card-indexed, labelled, and placed on the shelves in their proper classification sequence. They are all bound in Chinese cases (t'ao). For these 2,054 works 38 catalogues have been typewritten in triplicate and, correspondingly, two sets of index cards, namely: title cards, 4,500; Authors' cards, 4,170; Total 8,670 cards. Aside from these 50,640 volumes there are 6,000 not yet identified. Another consignment of 5,305

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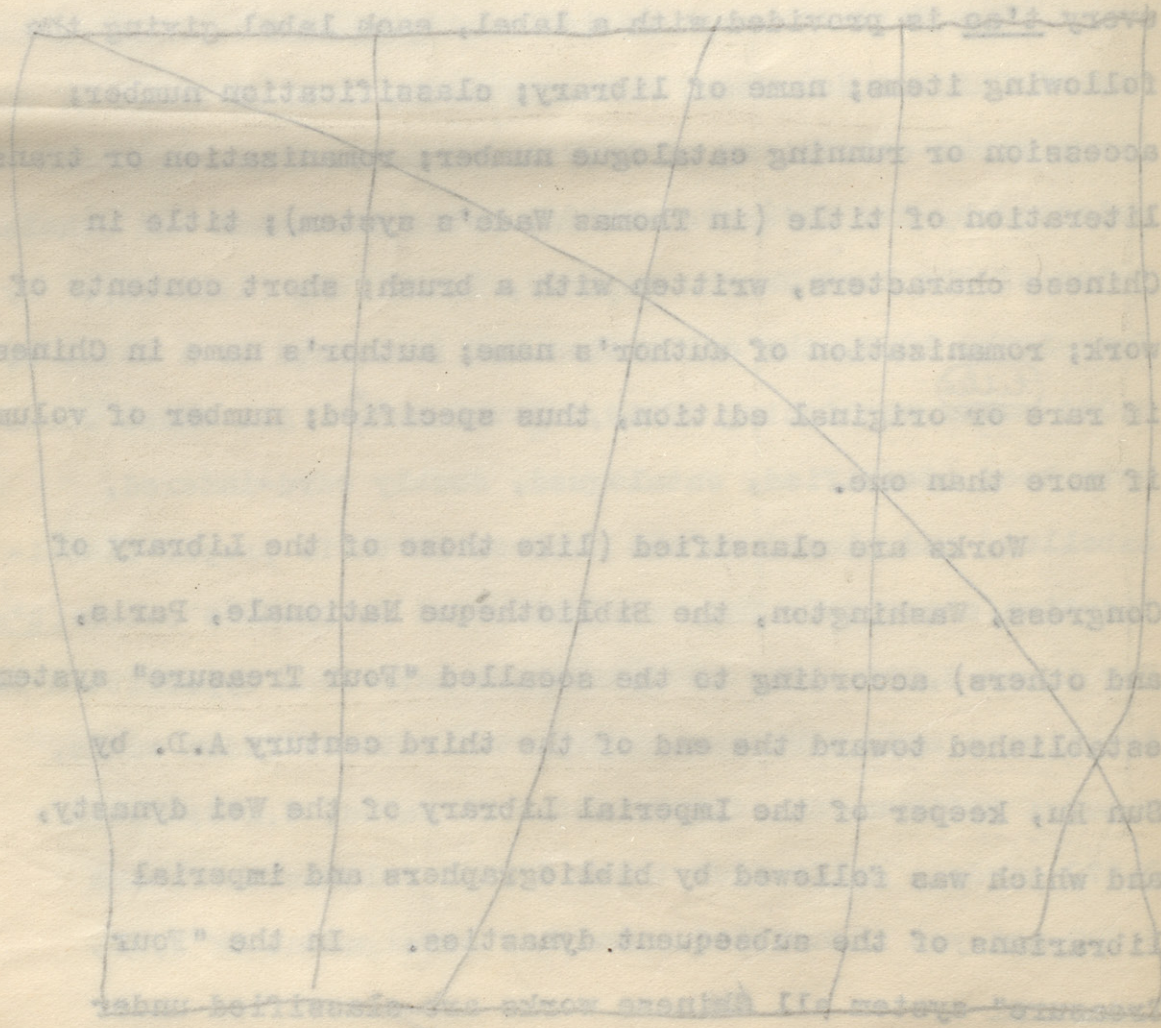
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* Greatly increased since that date.- Compiler.

volumes arrived on July 13th of this year at Vancouver, and approximately 15,000 volumes from a famous private library in China are expected the latter part of this summer. Valuable works will be continually added. Beginning from Cat. No. 305 all works were selected by Mr. I. V. Gillis. Excepting a few modern works bought from Peking and Shanghai bookstores, all the works in the collection were formerly in the possession of Manchu princes, well-known statesmen, or bibliophiles.

"All books are bound in Chinese style, i.e., cloth cases held together by bone slips (ku tsien)." ~~The back of every t'ao is provided with a label, each label giving the~~ following items; name of library; classification number; accession or running catalogue number; romanization or transliteration of title (in Thomas Wade's system); title in Chinese characters, written with a brush; short contents of work; romanization of author's name; author's name in Chinese; if rare or original edition, thus specified; number of volumes, if more than one.

Works are classified (like those of the Library of Congress, Washington, the Bibliothèque Nationale, Paris, and others) according to the socalled "Four Treasure" system established toward the end of the third century A.D. by Sun Hu, keeper of the Imperial Library of the Wei dynasty, and which was followed by bibliographers and imperial librarians of the subsequent dynasties. In the "Four ~~Treasure" system all Chinese works are classified under~~

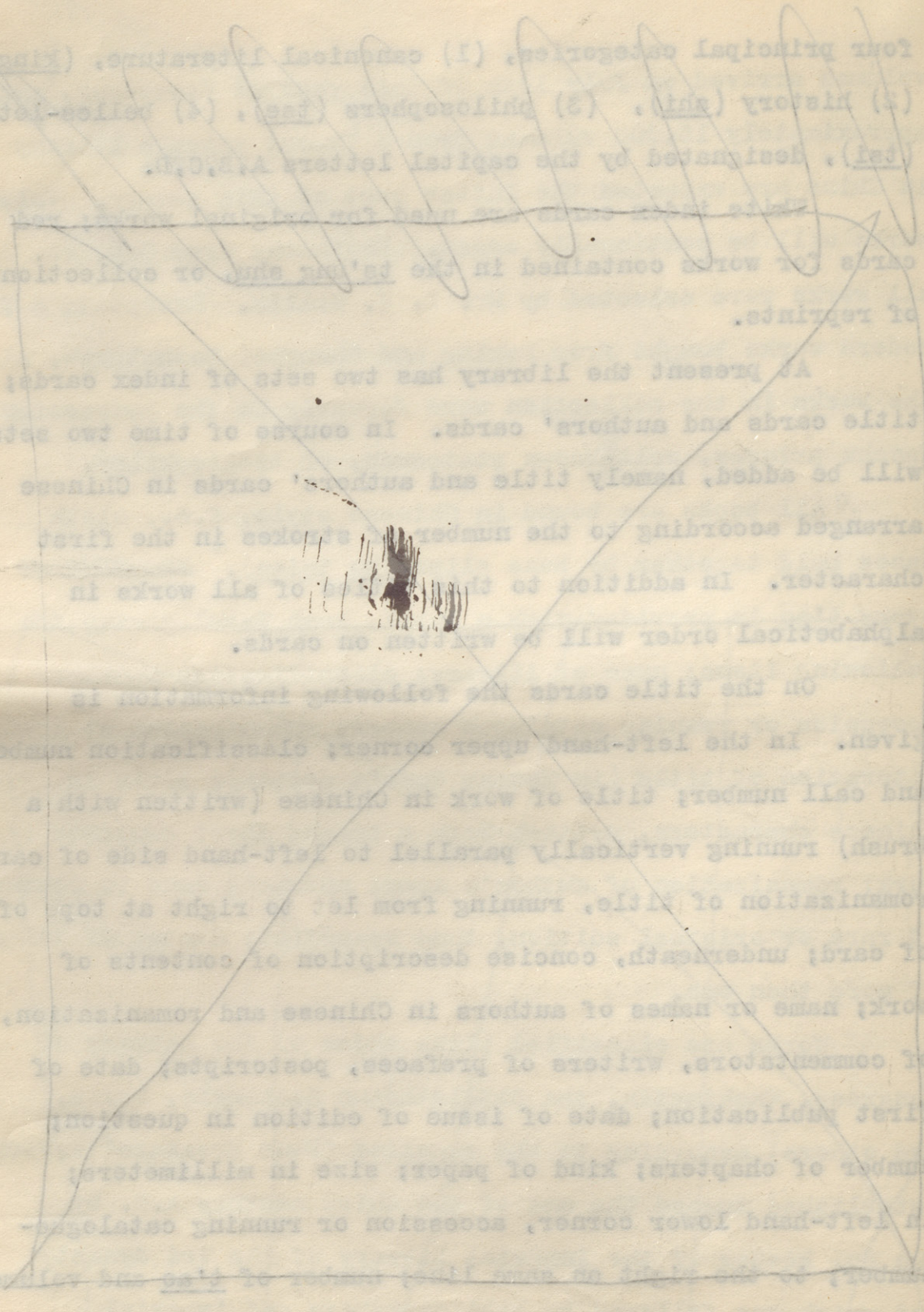


four principal categories, (1) canonical literature, (king), (2) history (shi), (3) philosophers (tse), (4) belles-lettres (tsi), designated by the capital letters A,B,C,D.

White index cards are used for original works; red cards for works contained in the ts'ung shu, or collections of reprints.

At present the library has two sets of index cards; title cards and authors' cards. In course of time two sets will be added, namely title and authors' cards in Chinese arranged according to the number of strokes in the first character. In addition to this titles of all works in alphabetical order will be written on cards.

On the title cards the following information is given. In the left-hand upper corner; classification number and call number; title of work in Chinese (written with a brush) running vertically parallel to left-hand side of card; romanization of title, running from let to right at top of of card; underneath, concise description of contents of work; name or names of authors in Chinese and romanization, of commentators, writers of prefaces, postcripts; date of first publication; date of issue of edition in question; number of chapters; kind of paper; size in millimeters; in left-hand lower corner, accession or running catalogue-number; to the right on same line; number of t'ao and volume.



Authors' cards are written out in the same manner, with contents of work, etc.

The Library is at present well equipped for research-work. It is especially strong in dictionaries, historical works, catalogues, encyclopedias and medicine.

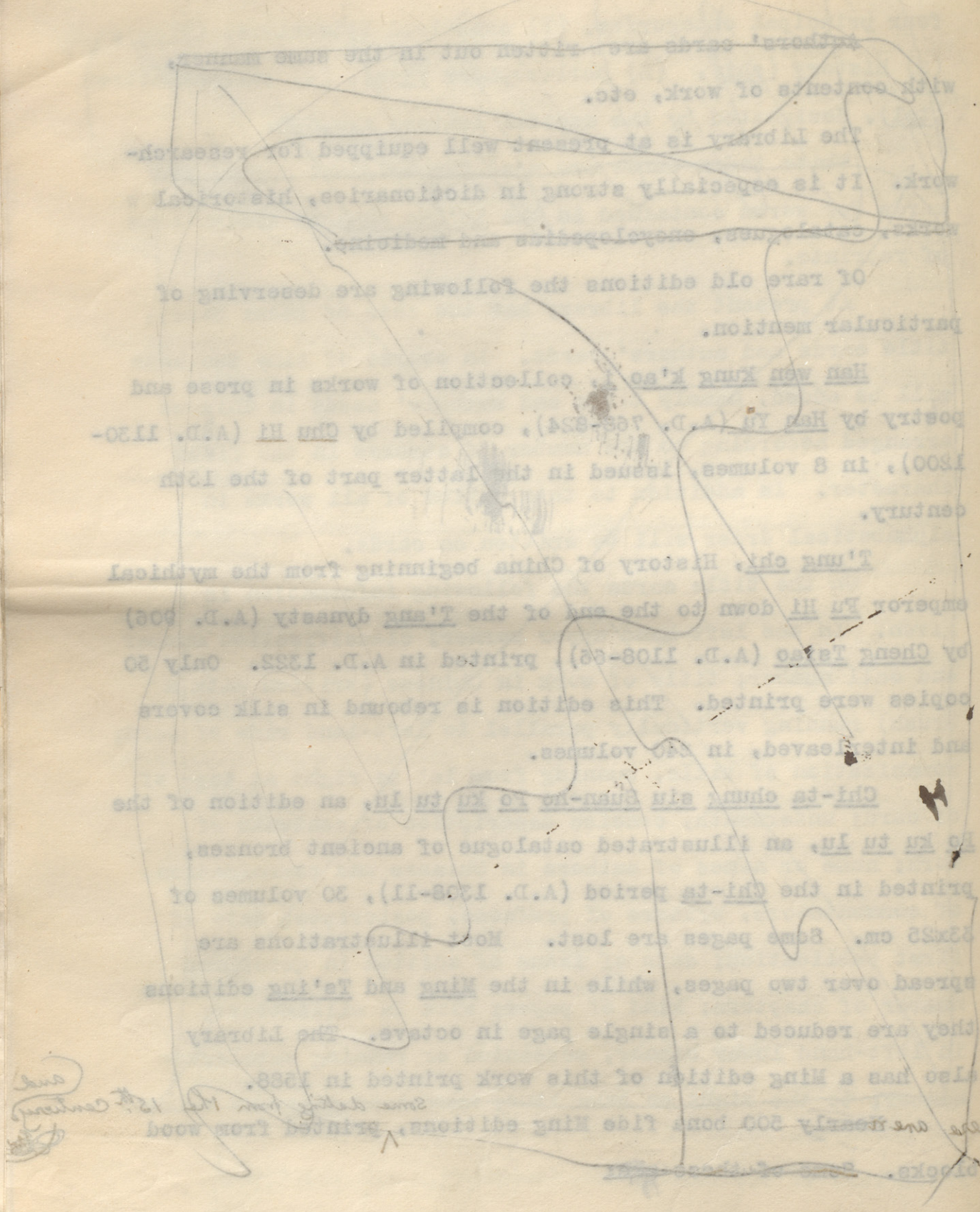
Of rare old editions the following are deserving of particular mention.

Han wen kung k'ao, collection of works in prose and poetry by Han Yü (A.D. 768-824), compiled by Chu Hi (A.D. 1130-1200), in 8 volumes, issued in the latter part of the 13th century.

T'ung chi, History of China beginning from the mythical emperor Fu Hi down to the end of the T'ang dynasty (A.D. 906) by Cheng Tsiao (A.D. 1108-66), printed in A.D. 1322. Only 50 copies were printed. This edition is rebound in silk covers and interleaved, in 240 volumes.

Chi-ta chung siu Süan-ho Po ku tu lu, an edition of the Po ku tu lu, an illustrated catalogue of ancient bronzes, printed in the Chi-ta period (A.D. 1308-11), 30 volumes of 33x25 cm. Some pages are lost. Most illustrations are spread over two pages, while in the Ming and Ts'ing editions they are reduced to a single page in octave. The Library also has a Ming edition of this work printed in 1588.

There are nearly 500 bona fide Ming editions, printed from wood blocks, some dating from the 15th century and



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Of Palace or Imperial editions, printed on special paper in only 50 copies (volumes in the imperial yellow color), the Library has 48 works. ~~Among these are:~~

~~Shu king t'u shwo~~, Text and explanation of the Shu King, "Book of History", compiled by order of the Empress Dowager richly illustrated; issued in A.D. 1905, 16 volumes.

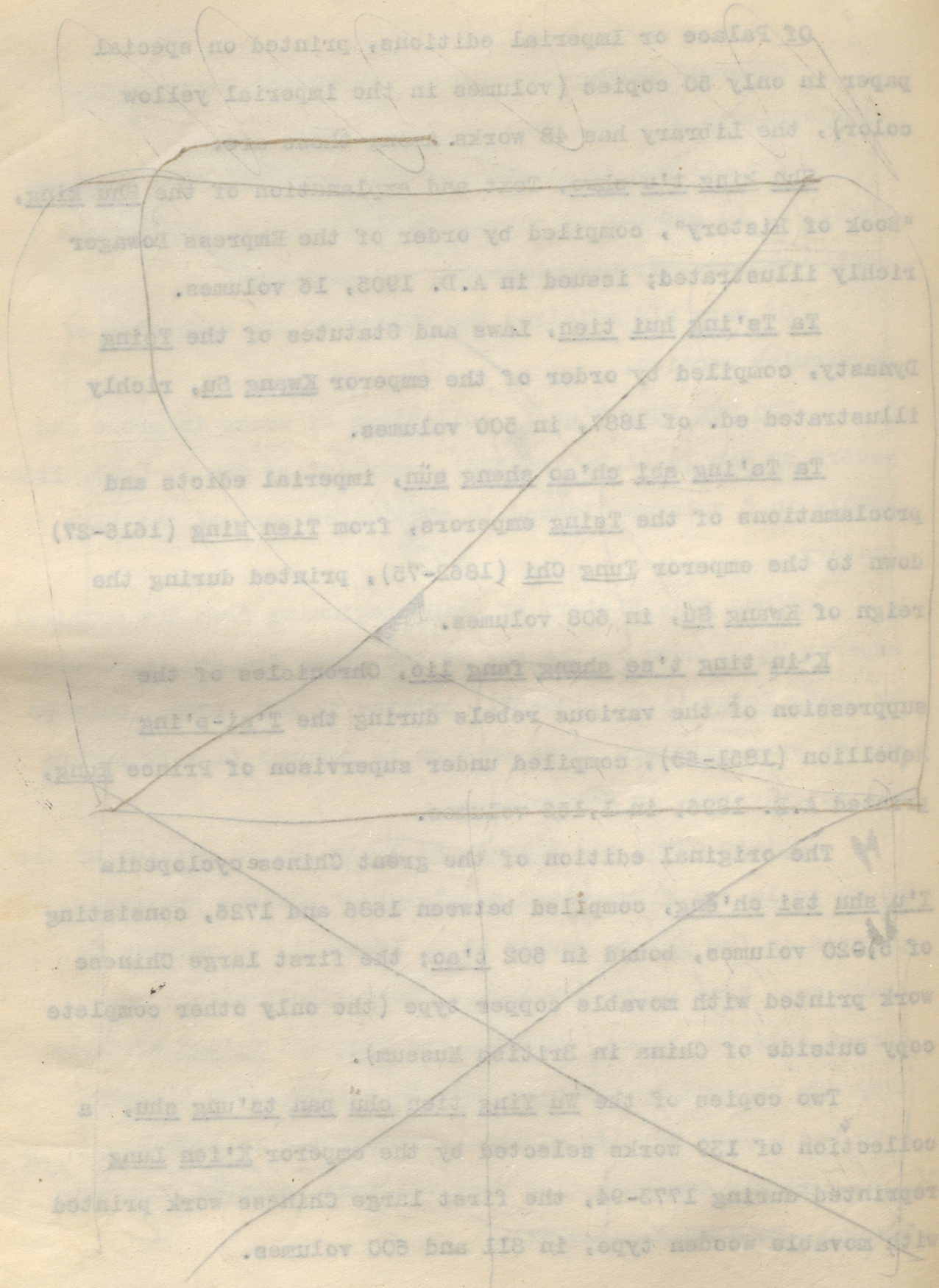
Ta Ts'ing hui tien, Laws and Statutes of the Tsing Dynasty, compiled by order of the emperor Kwang Su, richly illustrated ed. of 1887, in 500 volumes.

Ta Ts'ing shi ch'ao sheng sün, imperial edicts and proclamations of the Tsing emperors, from Tien Ming (1616-27) down to the emperor Tung Chi (1862-75), printed during the reign of Kwang Sü, in 608 volumes.

K'in ting t'se sheng fang lio, Chronicles of the suppression of the various rebels during the T'ai-p'ing Rebellion (1851-65), compiled under supervison of Prince Kung, ~~printed A.D. 1896, in 1,156 volumes.~~

The original edition of the great Chinese cyclopedia T'u shu tsi ch'êng, compiled between 1686 and 1726, consisting of 5,020 volumes, bound in 502 t'ao; the first large Chinese work printed with movable copper type (the only other complete copy outside of China in British Museum).

Two copies of the Wu Ying tien chü pan ts'ung shu, a collection of 139 works selected by the emperor K'ien Lung reprinted during 1773-94, the first large Chinese work printed with movable wooden type, in 811 and 600 volumes.



¶ The general library of the University was originally founded by and named after the Hon. Peter Redpath, who also erected the main building that houses most of its 250,000 volumes. Although no particular effort was made during the last hundred years to acquire books on natural history ~~one is~~ the present Catalogue lists quite a few important works on vertebrate zoology ~~to be~~ acquired by the Redpath Library during that period. Among them is an original subscription copy of Audubon's magnificent Birds of America, elephant folio; rare, early French and British voyages of zoological interest; presentation copies of natural history books to Sir William Dawson, the celebrated Chancellor of the University; a complete set of British Museum publications, and so on. Recently the University purchased the library and museum of the defunct Montreal Natural History Society and with it many volumes of scientific periodicals and other works that filled serious gaps in its shelves. Under the fostering care of Dr. Gerhard Lomer, the energetic University Librarian, this department of the McGill equipment has made rapid progress in all directions.

The McGill libraries, especially the Oslerian and Medical sections, have a representative collection of works on the extremely interesting and professionally valuable study of comparative pathology, including textbooks and other treatises on veterinary medicine and surgery. However, the Compiler does not consider it wise to do more than mention this fact here. The literature of animal diseases, their diagnosis and treatment, apart from a few exceptions listed in the appended

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he,
Catalogue for particular reasons, regards as foreign to the purposes of this Introduction and so refers special students to the card indices of the sectional libraries mentioned.

¶ Attention may be drawn ~~also~~ to the Lyman Library and Museum of Entomology, a valuable research collection of treatises and periodicals and specimens founded and endowed half a century ago by (Henry Herbert Lyman (1854 - 1914) McGill Governor.) together with many titles on invertebrates in the Blacker Library, This collection completes the array of

~~Insert~~ (XXIII)

~~(XXIII)~~. Insert.

~~The Dr. Albert F. Winn is the efficient Librarian. The~~ Museum was formally opened in 1882 and the Library in 893. There are over 1500 bound volumes in the collection ab represent the most important works on Entomology) nd thousands of unbound periodicals and tracts, mostly isted in an easily accessible card catalogue. The efficient Librarian is (Mr. albert F. Winn.) Quite a few titles include substantial references to vertebrate zoology (in the Lyman Library) and are, in consequence, included in the appended Catalogue.

that characterize

Bashford Dean's Catalogue of Fishes, in which not only every monograph but every published contribution (to the end of 1923) from every known source (periodicals included) is listed and evaluated (by the author and his associates). As part of such a herculean task there might be published a

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see insert D XXIII

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¶ The reader is warned in advance that ~~the Introductory portion of~~ this work makes no claim to the (as yet) unfilled position of a complete study in English of the literature of vertebrate zoology any more than the Catalogue that follows constitutes a fully annotated list of that literature. The Compiler does, however, hope that the McGill libraries have gathered a sufficient number of ~~faunal titles~~ biological items to justify their ~~present~~ publication as a basis for an elementary thesis on the literature of ~~the subject~~ vertebrate zoology.

A complete annotated account of the literature of biology might possibly be published in twenty or thirty folio volumes if carried out with the meticulous care and marvellous patience that characterize, for instance, that remarkable production, Bashford Dean's Catalogue of Fishes, in which not only every monograph but every published contribution from every known source (periodicals included) is listed and evaluated. As part of such a herculean task there might be published a

to the end of 1923 by the author and his associates.

like evaluation of the literature of ornithology (already partially accomplished in Zimmer's annotated Catalogue of the Ayer Library), of Mammology, and eventually of herpetology and amphibiology. Meantime the present writer offers his Introduction and partially annotated Catalogue as a contribution to a study of the whole subject of vertebrate zoology.

Shortly after the beginning of the present task the Compiler began to see as through a glass darkly what Osler perceived at once, viz, that some sort of Index would be necessary in an annotated catalogue of the type he proposed. "The task", (of making the Bibliotheca Osleriana) he said, "is perhaps too heavy for one man to undertake; but I am assured by experts that there is no inherent difficulty in such a catalogue provided there is a good index." Later his literary executors reported that " one of the rules laid down by Sir William Osler was that cross-references, except in the index, should be reduced to a minimum. When his scheme was criticised, and manifest objections were raised..... he had a ready if hyperbolic answer "We'll print in large letters at the top of each page, CONSULT THE INDEX FIRST."

Since in the Compiler's case an index might be useful to alleviate or even neutralize some of the bibliographic offenses of which he has been guilty in the present undertaking he has devised a student's and librarian's geographic and author key (Part B) to the chief works on vertebrate zoology from the earliest times to the present. With this Index, arranged in geographic and chronologic order, it is hoped that it will be useful to and

an find favor in the eyes of those whom it is especially intended to serve--enabling them to find in a few minutes the chief authorities on any subject covered by the agenda of this volume.

No student of zoological literature can be said to have had a liberal education who is not to some extent familiar with the bibliography not only of natural science, but of bookmaking in general.

Assuming that the Compiler's experience may serve as some sort of guide to this knowledge the following short titles (all in the McGill libraries) are given as among his chief sources of information in the preparation of the present volume:

Bibliotheca Osleriana, Oxford, 1929;

Bashford Dean, Bibliography of Fishes, 1895-1923;

J. T. Zimmer, Catalogue of the Ayer Library, 1926;

~~Milne-Edwards, Leçons sur la Biologie, 28 vols.~~

Erie Nordenskiöld, History of ~~Zoology~~ Biology, 1929;

Ernest Hirsch-Schweigger, Zoologisches Wörterbuch, Berlin, 1925;

L. Camerano, Materiali per lo studio di Zoologia in Italia nelle prima metà secolo XIX;

L. von Graff, Die Zoologie seit Darwin. 1896;

Victor Carus, Geschichte der Zoologie, 1872, and its Translation, Histoire de Zoologie by Prof. Schneider;

J. B. Spix, Geschichte aller Systeme in der Zoologie, etc., 1811;

C. G. A. Giebel, Thesaurus Ornithologiae, 3 vols., 1872-7;

C. D. Sherborn, Index Animalium, Lond., 1902;

D. H. McNicoll, Dictionary of Natural History Terms, 1863;

~~Geschichte der Zoologie.~~

Alfred Newton, Dictionary of Birds, 1893-6;

Eliott Coues, Key to North American Birds, 1925;

W. A. Locy, History of Biology;

Max Meisel, A Bibliography of American Natural History, 1924;

List of Biographies on Special Subjects in the Crerar Library, Chicago, 1902;

H. C. Bolton, Catalogue of Scientific and Technical Periodicals, 1665-1895, 2nd, edition, 1897; and as a supplement:-

Wm. J. Fox, American Journals omitted from Bolton's Catalogue.

~~1900.~~ A as a general proposition, also, the Compiler agrees with the list given by J. S. Kingsley (Naturalist's Assistant, 1882) of 1500 titles necessary for the Systematic Zoologist;

Mullens and Swann, Bibliography of British Ornithology, Lond., 1917;

R. Friedländer, Naturae Novitates, 1879- date;

Societatum Litterae, Verzeichnis.....auf dem gebiete der Naturwissenschaften (Huth et al.), 1888-1900;

British Museum, Catalogue of the books, manuscripts, maps and drawings in the British Museum (Natural history), Lond., 1903 ~~et seq.~~ et seq.;

British Museum, Catalogue of the printed books in the library of the British Museum, Lond., 1881-1900, 75 vols., and Supp. 11 vols;

J. L. Burns, Bibliography of scarce or out of print North American amateur and trade periodicals devoted to ornithology, 1915;

Engelmann, Wilhelm, Bibliotheca historico-naturalis. Verzeichniss der Bücher über Naturgeschichte welche in den Jahren 1700-1846 erschienen sind (Index

librorum historiam naturalem...) Lpz., 1846 Bd.1. 8+786.p.8vo;

continued as:

Bibliotheca historico-naturalis... Supplement-Band, enthaltend die in den periodischen Werken aufgenommenen and die vom Jahre 1846-1860 erschienenen Schriften, (Bibliotheca zoologica... bearbeitet von J.V. Carus ... und W. Engelmann,) Lpz., 1861, 2 Bd. 8vo;

S.H. Scudder, ~~Catalogue~~ Catalogue of Scientific serials...1633-1876. Camb., Mass., 1879, (Harvard University - Library. Special publications, 1,);

Severance, H. O. Guide to the current periodicals and serials of the U. S. and ~~Canada~~, 4th, ed., Ann Arbor, 1920; ~~Ind.p.~~

Societatum litterae, Verzeichniss...auf dem Gebeite der Naturwissenschaften,..Hrsg. von E. Huth(and afterwards A. Hering and M. Klittke), Berlin, 1888-1900; ~~Jahrg.1-14.~~ trs.

Wiegmann's Archiv für Naturgeschichte, ~~Fortsetzt unter~~ Zoologie, Berlin; ~~1835.~~

Zoologica, Hrsg. von R.G.F.R. Leuckart und C.Chun; ~~Stuttg. 1887-~~ ~~Bibliotheca zoologica.~~

Zoological Society of London, Catalogue of the library; ~~2d ed. Lond., 1880.~~

~~Zoological Society of London. List of abbreviations, with titles, of journals containing papers...of zoological importance. 1888.~~

Zoological Record to date.

~~Zoologisches Centralblatt. Lpz., 1894-1912. Jahrg. 1-18.~~

~~Lpz. Zeitschr. f. wiss. Zoologie, abth. A. Zeitschr. f. wiss. Zoologie, abth. B.~~

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G. R. Lomer and M. S. Mackay. Catalogue of Scientific periodicals in Canadian libraries, 1924; J. Deyander's Catalogue of the Bankian Library, 5 vols.; Union List of Serials, 1927; and the U. S. Catalog of Books, 1929.

¶ The Encyclopedia Britannica; International Encyclopedia; Chamber's Enclycopedia, the recent Encyclopedia Italiana and similar treatises contain many valuable monographs on the various sections and subsections of vertebrate zoology. ¶ Although somewhat out of date a useful work of reference is Nemnich's Polyglotten-Lexicon der Naturgeschichte, 3 vols. 1793. ¶ It is not necessary to list here all the standard works of general reference, including those that deal especially with incunabula and other early printed books, but the well-known Catalogues of Hain, Pollock, Pellechet, Brunet and others of similar character (to be found in every properly equipped research library) should, like the foregoing titles, be at hand for consultation.

¶ As a preliminary study of ~~the~~ this subject there is no monograph in English that covers the ground in a more interesting fashion than Geo. Haven Putnam's Books and their Makers during the Middle Ages, 2 vols., 2nd. ed., N. Y. (1896). This monograph gives an illuminating account of the subject from the fifth to the beginning of the eighteenth century and should be read by every student of that important era in book making.

Studies in the History of Medieval Science, by Charles Homer Haskins, 2nd. ed., Cambridge, 1927, is another volume that the student will find interesting and valuable.

~~Henry Curwen's illustrated History of (British) Booksellers, 8vo. London (1873) is well worth reading and covers most of the stationarii of Great Britain from William Caxton to the best known dealers of the nineteenth century.~~

¶ In Ronald B. McKerrow's An Introduction to Bibliography, Oxford, 1927, the student will also find a practical manual containing much information—presented in an easy and attractive

It will be of signal advantage to the student of zoological literature if he becomes acquainted with the "sales catalogues" issued from time to time by the larger dealers in scientific works. Among these may be mentioned the publications of Bernard Quaritch, and Maggs Bros., London; Friedländer und Sohn, Berlin; L'Art Ancien, Zurich; and of Taeuber und Weil, Munich. In many of these catalogues will be found useful bibliographical notes.

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that task had the benefit of Miss Margaret S. Mackay's unusual acquaintance with natural history periodicals. Without the cooperation of these trained experts, the present task could not have been completed.

¶ Professor Arthur Willey, Director of the Department of Zoology in McGill, has most kindly written the notes of many non-English titles of zoological works in the libraries, while Mr. Henry Mousley has evaluated a large proportion of the treatises printed in English. For the remaining notes the Compiler is responsible.

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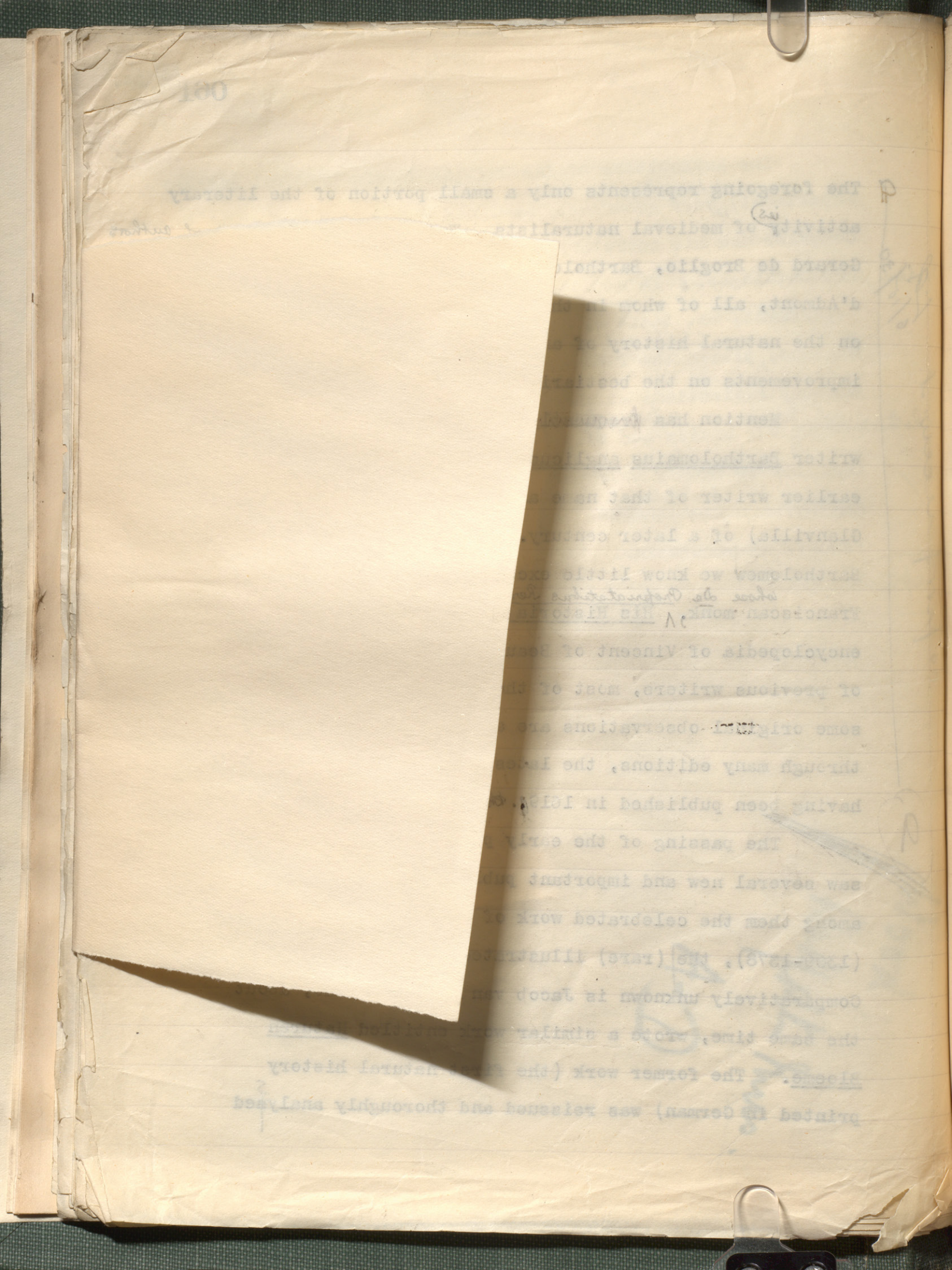
The Authorities of the British Museum (Natural History Department), especially the Keeper, very generously assigned a room and equipment to the Compiler and his secretary for two years work on the Introduction, Index, and Catalogue. The Compiler is especially indebted to the Librarian of the Zoological Department, Mr. Basil H. Soulsby, and his successor Mr. Cockburn Townsend, while assistant, Mr. H. W. England, very kindly and helpfully placed the resources of their invaluable natural history collections at the Compiler's disposal. Dr. Ernest Hartert and the Rothschild's Museum at Tring have also furnished valuable aid. For advice and help in the present undertaking the Compiler is deeply indebted to several associates in the Smithsonian Institution, in particular to Dr. Chas. W. Richmond and Dr. Alexander Wetmore, the Assistant Secretary. [illegible] hospitable

Moore, Joseph Pohle
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The foregoing represents only a small portion of the literary activities of medieval naturalists. We may add to the list of authors Gerard de Broglio, Bartholomaeus de Bragantiis and Engelbert d'Admont, all of whom in the thirteenth century wrote codices on the natural history of animals, each of them advances and improvements on the bestiaries of that period.

Mention has frequently been made of that important writer Bartholomaius anglicus. Of course one refers to the earlier writer of that name and not to the de Granville (or Glanvilla) of a later century. Of the more important Bartholomew we know little except that he was an English Franciscan monk, whose De Proprietatibus Rerum (q.v.) is among the most famous of medieval writings. His Historia (Liber) animalium is, like the encyclopedia of Vincent of Beauvais, an immense compilation of previous writers, most of them familiar to us, to which some original observations are added. The work passed through many editions, the latest one known to the Compiler having been published in 1619.

The passing of the early part of the medieval period saw several new and important publications on zoology, among them the celebrated work of Conrad von Megenberg (1309-1378), the (rare) illustrated Buch der Natur. Comparatively unknown is Jacob van Maerlandt who, about the same time, wrote a similar work entitled Naturen Bloeme. The former work (the first natural history printed in German) was reissued and thoroughly analysed



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by Franz Pfeiffer, Stuttgart, 1861, and the student is referred to that review. Von Megenberg reflects the first glimmerings of the humanistic, renaissance torch. Although a Dominican friar and presumably much influenced by ecclesiastic conventions and traditions, his book exhibits many decided advances on previous treatises. Several reprints and editions of this fundamental treatise have appeared during the past four hundred years.

Let us now glance at the zoological literature of a comparatively modern epoch, that post-medieval era when University teaching had expanded and had been liberalized, when Speech became freer and, above all, when the invention of printing brought works on natural philosophy, both ancient and recent, within reach of the many.

This revival of zoological research in in Europe was, of course, a part of the New Birth of science. All the currents of independent thought, as opposed to superstition and mere authority, ran towards a scientific River of Doubt and Exploration.

Of those that lived and worked on the borderland of the Old and the New was Edward Wooton (1492-1555), son of a college porter in Oxford University, who rose to distinction as a practising physician. He worked for over twenty

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years on his De differentiis animalium and proved himself a faithful follower of Aristotle, whose animal classificati on— viviparous quadrupeds, oviparous quadrupeds, sanguineous animals, non-sanguineous animals, etc—he accepted. He did, however, reject many of the fabulous creatures whose pictures and descriptions had been handed down from antiquity, although he—die Güte liegt so nah—rarely gives a description of ~~the~~ many new forms that, quite at hand, British explorers were constantly bringing to England. One must, of course, not forget, ~~even in a brief sketch like this!~~ that Wotton was, as a physician, mostly interested in the medicinal uses of the animals he described.

Cuvier thinks that the commentary by Petrus Gyllius (Leyden, 1583) on Aelian should be bracketed with Wotton's work. The former is entitled "Ex Aeliani historia latini facti ..... de ~~[illegible]~~ vir et natura animalium". This claim does not appear justifiable although Wotton does quote Gyllius a number of times, and was probably influenced by his writings.

Animal dialogues were, following the invention of printing, published in plenty after the style of the Medieval Physiologus—the most noticeable one being the

Lucidarius (or Elucidarius) attributed to Anselm of Canterbury. The first edition appeared in 1479, since which date many printings of it have been made in almost every European language. It was, in fact, a "best seller" of its day.

Dame Juliana Berners, at one time Prioress of the Nunnery of Sopwell, Herts., flourished about 1460 and wrote treatises on Hawking, Hunting, Coat-Armour, Fishing and Blasing of Arms. These tractates form the famous Book of St. Albans, the first edition of which was printed and published by Wynkyn de Worde in 1496. It is profusely illustrated by excellent woodcuts and has been several times reprinted. In the course of this work the natural history of hunted animals--birds, fishes and mammals--receive attention, thus making it a proper title for a zoological library.

Probably the best account of the life and writings of Dame Berners is given by Joseph Haslewood as a preface to the facsimile edition of London, 1810, a historical research of great zoological value and one well worth reading. This work is now among the rarities but an example will be found in the Blacker Library, together with a unique MS. copy of the same edition.

¶ The early post-medieval period was also, it must be remembered, an era of numerous Herbals and faunal pharmacopeias in which not only plants but animal parts were described for their value as remedies in disease. A few

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of these are of zoological importance because of the description of the animals themselves. Apart from that consideration Kräuterbücher and other herbals do not really belong to this Introduction.

The titles Gart (Garten)der Gesundheit, Hortus (Ortus) Sanitatis, and Garden of Health have an oriental suggestion. Under the first heading it appears as the earliest printed German Herbal having natural history interests. It had also an important standing as ~~being~~ one of ~~among~~ the first prints illustrated by woodcuts. This celebrated natural history treatise was probably a compilation by Johann von Cube, a Frankfurt physician. It was derived from various ancient and medieval sources, notably from the Speculum Naturale of Vincentius de Beauvais, the Etymologiae of Isodorus Hispalensis, and from Megenberg's Buch der Natur. The first edition of the Hortus was published in Mainz by Peter Schöffer in 1485, (Hain 8948), since which date many variants, large and small, have appeared in several languages, including English. Probably the most elaborate edition is the Hortus Sanitatis Major, folio, Mainz, 1491, Jacob Meydenbach, (Hain 8944), 453 leaves, zylographic title-page, seven full-page and over

a thousand smaller woodcuts of plants, animals, and minerals. As Payne has said, it was the model for all subsequent editions. Folio editions with full-page cuts are called "major"; smaller formats "minor", or are not distinguished by any adjective. Occasionally some of the cuts are colored, but these are not as a rule accurate and do not assist in elucidating the text.

One of the Blacker copies (the second edition) of the Hortus Sanitatis Major, Strassburg, Johann Pryss (ca. 1497) folio, 360 leaves, has three full-page woodcuts, 530 smaller cuts of plants, 164 of quadrupeds, 122 of birds, 106 other animals and 144 of minerals, and the text includes most of the zoological facts of Megenberg's Buch der Natur. The large initials are rubricated, the woodcuts are old-colored, and there are a few contemporary marginal notes. Choulant calls the Hortus the most important illustrated natural history of the middle ages. Five editions ~~of the Hortus~~ are shelved in the McGill libraries, two of them incunabula.

The outstanding product of the New Birth in zoology was Conrad Gesner (Gessner) of Zurich, early a student of medicine, philosophy, etc. at Paris, Montpellier, and Basel. This versatile genius was at one time professor of Greek at Lausanne and eventually was appointed municipal physician of his native town, where he died of the plague in 1665. His comparatively short life was a continual

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struggle with hardships; to gain a living he had to do much hackwork in many departments of literature. Perhaps his superabundant energy was stimulated by these obstacles; at any rate he found time to accomplish what might well have absorbed the vitality of several men of genius. Among his many writings is the famous Historia animalium, 1551, four large folios of nearly 3500 pages, in which he classified species on the Aristotelian plan, although the influence and example of Pliny are also noticeable throughout. The first part treats of quadrupeds, the second of birds, the third section of fishes and the fourth, a posthumous work, of reptiles and insects. Its alphabetic arrangement and the careful preparation of the text appeal to the student. Numerous original observations are recorded, and he rejects (on stated grounds) many of the fabulous animals accepted by his predecesssors.

Probably the highest compliment paid to this voluminous compiler is the attempt of the Germans to adopt him, with the title of the "Pliny of Germany". As a matter of fact Gesner was born, lived, wrote and died in Switzerland, and was proud to be called a Swiss. Osler refers to him as follows:-

"Conrad Gesner, who kept open house,....for all learned men who came into his neighbourhood....was not only the best naturalist among the scholars of his day

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but of all men of that century he was the pattern man of letters. He was faultless in private life, assiduous in study, diligent in maintaining correspondence and good will with learned men in all countries, hospitable—though his means were small—to every scholar that came into Zurich. ..... While finding time for services to other men he could produce as much out of his own study as though he had no part in the life beyond its wall,..... He is the father of Bibliography."

An important inovation in this remarkable work was the employment of illustrations, by the best artists of the day; indeed, he draws attention to the fact that the picture of the rhinoceros was made by Albrecht Dürer. It is hardly necessary to say that the Historia animalium long continued to be a storehouse from which succeeding writers "borrowed" many a helpful page.

So far as concerns quantity in the literature of sixteenth century natural history at least one follower of Gesner surpassed that great writer. He is Ulisse Aldrovandi who, born in 1552 of a Bolognese family, studied philosophy and medicine at Rome and Padua. He was later made professor at Bologna where he resided for forty years, dying at the advanced age of ~~eighty~~ 80, when he willed his large collection of natural objects, including many unpublished manuscripts, to his native city.

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Probably his treatises are an improvement on those of his prototype Gesner, although Buffon (who ~~doubtless~~ superseded him) declares that only about ten per cent of Aldrovandi's work is worth preserving. However, Nordenskiöld holds that his illustrations, typography and classification are improvements on Gesner's.

Guillaume Rondelet was born in 1507 at Montpellier, where he later taught anatomy in the University. He is best known by his work on sea fishes--De Piscibus marinis--which included whales, seals, cephalopods, crustaceae and vermes. He was especially noted for his dissections of these animals, which led him to contradict many of the assumptions of Aristotle.

Pierre Belon, born in 1517 at Le Mans, was a medical naturalist who traveled widely, made large collections of animals--especially of fishes--and wrote at least two monographs on marine life. They are entitled La Nature et diversités des Poissons and L'Histoire naturelle des étranges poissons marins, both of which include even a wider range of species than those described by Rondelet. However, Belon regarded almost every mammalian swimmer as a "fish", among them the otter, the hippopotamus and the beaver. During his Eastern travels he discovered several oriental types unknown to his contemporaries. It must be noted that his piscine classification approaches the modern and includes a division of true fishes into bony and cartilaginous. Belon did even

better as an ornithologist. His Histoire des Oyseaux (1555) arranges the various groups according to their structure and habits; there is in his writings much evidence of a study of the morphology and histology of species, while comparative anatomy is illustrated in the pictured comparison of the skeleton of a man with that of a bird in his first book on avian life. In this last regard he was far ahead of his times. ¶ Although Belon may be regarded as the first serious comparative anatomist, Leonardo da Vinci (1452-1519) helped along what is actually a modern study by his attention to anatomical details in art, just as Andreas Vesalius (1514-1564) created a new era in medicine and surgery by his careful attention to human dissection.

It is, however, to Fabricius ab Aquapendente (Girolomo Fabrizio) that we must look for the first wide application of Belon's attempt to place comparative anatomy and, perhaps, comparative embryology, where they rightly belong. His work on the development of the fertilized ovum is but a part of these investigations, most of which are fully illustrated.

In may respects Marcus Aurelius Severinus (1580-1656) is a more important comparative anatomist than his predecessors. His Zootomia democritea is not merely a defense of comparative anatomy in the modern spirit but is a systematic

treatise on that subject, with notes on his own zootomic experiences with birds, mammals, fishes and many invertebrates. He gives a full account of the dissecting instruments, lenses, etc. used in this histological art. The Compiler has his Ornitholographia, a chapter of the Zootomia, separately bound, actually a comparative study of the feet of birds.

Chapter III

~~Naturarzt. (Berlin). 1842-1888.~~

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Chapter III. — 12pt caps #d

Renaissance and its Effect on the Records of Zoological Sciences. Publications of Natural History Societies and Museums throughout the World. Some Sixteenth and Seventeenth Century Writers on Vertebrate Zoology.

Academia Naturae Curiosum — Academia dei Lynzei — Royal Society of London — Académie des Sciences de Paris and its congeners throughout France — The Preussiche Societät (Akademie) der Wissenschaften Berlin. Gesellschaft Naturforschender Freunde — and similar societies throughout Germany — Academie Royale des Sciences, Brussels — Academie d. Wissenschaften, Academie des Sciences, St. Petersburg — Swedish Société des Sciences et des Lettres and other Scandanavian natural history societies — The (London) Royal Asiatic Society and its associates in the Far East — Local British societies of natural history — The Smithsonian Institution and other American Natural History Societies and their numerous publications — K. Dansk Videnskabernes Selskab — Philadelphia Academy of Sciences — Associations for the Advancement of Science in England, America, France and Germany — International Congresses on Zoology —

Early and some Recent

Società Zoologica Italiana — British Local Faunists and their writings — Ferrante Imperato — Clusius — John Hunter — Ray — Willughby — Hans Sloane — W. Charleton — Johannes Jonstonus — Topsell — H. von Hoevel — H. H. Frey — W. Franz — Lochart — D. Sennert — Scaliger — Nieremberg — José d'Acosta — Hernandez — G. Piso — Molina — Gesner — Schwenkfeld — Borelli — C. Merrett — Sibbald — Agricola — Tulp — O. Worm — John Caius — P. Gillius — J. Bontius.

S. Collins. — G. Germano. —

2nd copy.

CHAPTER .

Pages 66-74
Early Standards
(Sketches)

~~As in other departments of knowledge we may regard the period of the renaissance, the century that substituted scientific investigation for the authority and myths of the church, as the chief source of an enlightened zoology.~~

~~An important happending (elsewhere discussed in this Introduction) was~~ The scientific awakening of Western Europe in the 16th. century, and the alliance of medicine with biological research in University study were followed by the founding of important academies, and museums societies for the special investigation of natural history. Among the first named were the Academia Secretorum Naturae, Naples, (1560,) (later suppressed by the church), ~~the Academia Naturae Curiosum, (1652),~~ the London Royal Society (1662), and the Paris Academy of Sciences, (ca. 1670.) These and numerous other early institutions, to be mentioned, published and some of them continue to publish to the present day important serials and periodicals devoted to ~~each~~ zoology, most of them on file in the Blacker and other McGill libraries.

The spirit of these institutions is well illustrated by the motto of the (London) Royal Society, "Nullius in verba."

In other words the rules of the [redacted] society insured the collection of carefully noted phenomena only and the critical investigation of all new or remarkable observations. As Lankester says, "Under the influence of the touchstone of strict inquiry thus set on foot by the Royal Society, the marvels of witchcraft, sympathetic powders and other relics of medieval superstition disappeared like mist before the sun."

~~We next turn our attention to~~ The Royal Society ~~of London~~ began to issue ~~issued~~ ~~in its~~ numerous important and continuous publications since its founda~~d~~tion in 1662; its fellowship still constitutes by far the most notable roster of British naturalists, and ~~with~~ its Philosophical Transactions (1664 to date) and other serials are essential to the usefulness of any biological library.

¶ The ~~The~~ output of zoological literature was from quite early times stimulated by the formation of these learned societies first throughout the western world and later in America and Asia, many of them devoted to the study of natural history. Only a partial list of these can be mentioned here but practically all of them had sections on natural history or had leanings thereto, and they are represented, with the titles of their literary products, in this Catalogue, as transactions, comptes rendus, annali, Abhandlungen, & etc., many of which are difficult to secure to-day.

Germany was among the first to found [redacted] scientific societie and academies. J.L.Bausch, a doctor of medicine in Schweinfurth in 1652, initiated the famous Academia Naturae Curiosorum which, under various changes of name, status and publications was destined to exert a powerful influence on European zoology and to survive until the present day. It is now best known as the Academia Caesarea Leopoldino - Carolina Germanica, [redacted] whose Nova Acta and other periodicals are shelved in the McGill libraries.

¶ Prominent among the early institutions of natural science in France is the famous Académie des Sciences de Paris, founded about the middle of the seventeenth century. After a reorganization and division of the Académie into sections there began a yearly publication of Mémoires which, interrupted only by the stormy days of 1796, have appeared regularly ever since. The list of academicians is practically that of the most renowned men (and women) of learning in the French dominions.

Quite as important for the present Introduction was the founding in 1626 of what was then the "Jardin Royal des Herbes medicinales", later the "Jardin des Plantes", and now the "Museum d'Histoire Naturelle". The Annales, Memoires, of this famous institution were first issued in 1802.

¶ The titles of the Paris Académie des Sciences were copied in many French cities - e.g. in Dijon, Marseilles, Amiens, Caen, Bordeaux, Lyon, Toulouse, Montpellier and Rouen. The titles of their natural history publications, largely collected for the Blacker Library, are to be found in the accompanying Catalogue.

Several short-lived academies about this time also appeared in Italy - the Academia dei Lincei, the Academia del Cimento (1651-1667), et al.

The foundation of the Académie Royale des Sciences, etc. at Brussels occurred in 1772, since which date many valuable Mémoires, etc. have been regularly issued, most of them listed in the Catalogue.

Owing to political and other complications the German Königliche Preussiche Societät (Akademie) der Wissenschaften was not founded until 1700. It underwent various titular changes and issued a variety of important periodicals (some of them published in the French language, fashionable during the reign of Frederick the Great and afterwards), that have regularly appeared, albeit under occasional changes of title, until our own time.

Of the many other noteworthy German societies devoted more or less to natural history and contributing much of value to zoological literature the Compiler can refer here only to a few,

Among them are the K. Academie der Wissenschaften, Wien, founded in 1846; the K. Gesellschaft der Wissenschaften at Göttingen, founded in 1751; the K. Akademie Gemeinnütziger Wissenschaften, founded in 1754 and displaying several changes of title; in Munich several virile societies, the earliest the König. Bayerische Academie der Wissenschaften, founded in 1758 and publishing (among many other periodicals) their Abhandlungen in 1763 with various continuations to the present year. In Dantzig, there was founded in 1743 the Naturforschende Gesellschaft, prototype of numerous societies with similar names founded through German-speaking Europe, that have published many Annalen, Versuche, Verhandlungen, Schriften, etc., most of which are still issued, and are listed in the present Catalogue.

Of the societies for the study of special departments of biology graduates developed in all civilized countries, one may mention here the important Paleontographical Society (founded in 1847) whose monographs, mostly in the form of annual volumes, have been issued since 1848. Those referring to vertebrate zoology will be found in the McGill libraries and a complete list to 1908 can be consulted on pp. 1501-02 of the Br. Mus. Cat. (Nat. Hist.)

Among the many - too numerous to receive mention here but mostly listed in the appended Catalogue - popular publications of German natural history societies is the active and productive Berliner Gesellschaft Naturforschender Freunde, the foster-parent of many similar societies in middle Europe. Founded in 1773 it has continued to function since that date and to publish continuously several periodicals of which, perhaps, the Schriften and its continuations (1780 to date) are the best known.

It was, in like fashion, the Kgl.-Preussiche Akademie (founded in 1700) that published the Descriptiones Animalium of J.R.Forster's voyage to the South Seas in 1772-74, and the zoologic reports of R. Kossmann's journey to the Red Sea, 1877-80.

A very important, vigorous and literature-producing Académie des Sciences was planned in St. Petersburg by Peter the Great and founded in 1725 by his widow, the remarkable Catherine I. Immense collections of books, manuscripts and natural objects were purchased throughout Europe by these rulers, while the activities of scientific investigations and investigators were encouraged during the past 150 years so that an extensive Russian ~~extensive~~ zoological literature, often published in several European languages (in addition to the Russian text), is familiar to all advanced students of systematic biology.

In 1720 Linnaeus helped to create in Uppsala and to write for the Swedish Société des Sciences et des Lettres. This was followed by the foundation of the Kongliga Svenska Vetenskaps - Akademien in 1739. The Arkiv, Handlingar, etc. of these important institution continue to be issued to the present time. See the appended Catalogue.

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Through the munificence of an Englishman there was founded in 1846 at Washington, what was destined to become a center of great scientific importance - the Smithsonian Institution. Its Annual Reports (begun in 1846), its famous Contributions to Knowledge (1848), its Miscellaneous Collections (1862) and many more publications of its branch organizations (especially the U.S.National Museum) have added a large number of original and extremely valuable monographs on vertebral zoology to the literature of biology.

In Denmark the University of Copenhagen with its scientific clientele has played an important part in the publication of zoological literature from 1671 onwards, aided by the Skrifter and other journals of such associations as the K. Dansk Videns-kabernes Selskab, founded in 1742. Many of the Danish serials and other periodicals are listed in this Catalogue.

Of much importance are the publications of the (London) Royal Asiatic Society and of its associates - the Asiatic Society of Bengal, Ceylon, Japan, Malaya, etc. The Smithsonian Institution, the Philadelphia Academy of Sciences and other flourishing natural history societies were more recently founded in America. The Journal of the Philadelphia Academy was founded in 1817.

At the risk of duplication one may at this time refer to a few rather important (some quite early) British publications in zoology partly dependant upon the impetus resulting from the establishment of local natural history societies. Some of these monographs will also receive attention elsewhere in this Introduction.

The Compiler has in mind such treatises as Irelands naturall history by Gerard Boate, 1652; Joshua Childrey's Britannica Baconica, 1662; C. Merret's Pinax rerum naturalium Britannicarum, 1666, (several editions); Robert Plot's Natural History of Oxfordshire, etc., 1677, (2nd edition 1705); the same author's Natural History of Staffordshire, etc., 1686; Chas. Leigh's Natural History of Lancashire, etc., 1700, and Robt. Sibbald's Scotia illustrata, 1684. These were, of course, the forerunners of those numerous and important local histories of which the Victoria History of the Counties of England is such a conspicuous example. Quite as plentiful is the supply of similar periodicals published by local British, Colonial and American institutions.

It was in the eighteenth century (1737) that F. de Plantade published his Mémoires pour l'histoire naturelle de Languedoc in much the same vein as the British monographs. In Switzerland J.J.Wagner had written and published (Zürich) as early as 1680 the Historia naturalis Helvetiae curiosa, that subsequently appeared in several editions. A Polish treatise by Gabriel Rzaczynski appeared in 1721, a Historia Naturalis curiosa Regni Poloniae.

As will be seen by later references in this Introduction the very useful, popular Associations for the Advancement of Science and similar societies in England, the United States, Germany and France were not founded until well into the nineteenth century. Various International Congresses devoted to the study and discussion of zoology in all its branches have also done much to advance that science. The literary output of these conventions is listed in the present Catalogue.

Elsewhere the publications of modern Italian natural history societies are mentioned and catalogued. Here one may refer to the active Società Zoologica Italiana (founded in 1892) whose Bullettino has been published in Rome since 1882.

Periodical literature has been given a special chapter in this Introduction; hence little more will be said of it in this place except to draw attention to the fact that societies devoted to natural sciences often stand *in loco parentis* to those most important titles in all faunal literature, viz: the transactions, magazines, journals, archives, annals, etc. that constitute the body of *periodica zoologica*. As is well recognized, most works in science, whether systematic or popular, are largely compendia or extensions of articles or papers previously published in ~~some~~ periodicals. For this reason the Blacker and other scientific libraries of McGill have striven to make their collections of journals as complete as possible, and to the captions of the Catalogue the reader is referred for more extended information ~~drawn from~~ regarding these original sources.

A number of writers on natural history during the period of the renaissance have already been mentioned. To these may be added more than one Italian, among them Ferrante Imperato (1550-1625), whose Dell'Historia Naturale, Naples, 1599, dealt with flora, fauna and geology in a rather original fashion, and whose twenty-eight books on the subject went through several subsequent editions.

Another early Italian naturalist, Ippolito Salviani, wrote in 1554 a work on aquatic animals; 256 (folio) leaves illustrated by 83 plates.

A Later there appeared an interesting work by Francesco Cercano vel Sforzino, entitled I libri de gli Uccelli da Rapina ..... con un tratatto dei Cani, 1622.

Still later, Joannes de Laet (1593-1649) published a disquisition (1648) on G. Marcgrave's and G. Piso's works, discussing the fauna and other natural products of Brazil.

Both the Osler and the Blacker Libraries have several titles headed by the name of that voluminous French writer Chas. de Lécluse (or Clusius) (1526-1609), whose zoological writings, translated into several European tongues, ought to be familiar to the student.

Another indirect result of the early foundation of scientific institutions was a race of investigators whose labors furthered greatly the onward progress of zoology. During the latter part of the 18th. century this evolution in literature culminated in Linnaeus, the father of systematic biology, and in such men as John Hunter, the famous surgeon, founder of modern comparative anatomy, a study that he helped to build on a firm foundation.

Of prelinnean names in systematic zoology, the most prominent is that of John Ray (1628-1705), or Wray (as he wrote himself until 1670), regarded by many as the founder of English natural history. Besides editing the works of his friend and pupil, Francis Willughby, he contributed much of value to the literature of zoology; indeed his writings greatly lessened the extensive labors of the great Linnaeus. He it was who defined the term "species", until his day loosely applied in the classification of animal life. In naming the larger groups he made unwonted use of anatomical characters and it is, perhaps, not incorrect to speak of him of the father of scientific zoology.

Ray was sent to Cambridge where, among other subjects, he studied natural history and eventually held University offices. Obliged to leave college on account of religious differences he joined Willughby, member of a rich and noble family, who enabled him to devote himself entirely to scientific studies.

The two friends (the older man addressed the younger as "amicus et Maecenas suus") went together on a two years' journey through Europe, travels that are recorded in Observations topographical, moral and physiological, [illegible] 1673, in which Ray printed his famous Catalogue of Plants not native of Emgland. Returning to England laden with collections of various kinds they settled down in Willughby's country house to work on the collected material; but this scheme was interrupted by the death of the patron who, however, made Ray one of his executors and appointed him guardian of his two sons.

Ray finally moved to the cottage left him by his parents where for over twenty 20 years he continued his numerous researches, the results of which have greatly affected the progress of science. Although he made botany his chief study, his literary work included all the divisions of zoology, ~~religious serm~~ ~~religious essays~~, folk-lore, Studies etc. Ray's classification of vertebrates is not really as comprehensive as that he made ~~as that he prefer~~ of plants; indeed it was Willughby who wrote the treatises on Zoology. ~~author of the treatises on zoology~~ After the premature death

of the latter his collaborator published, in his own name, a book on fishes and another on birds that were probably the combined work of both writers. Ray also wrote ~~treatises~~ works on quadrupeds, reptiles and insects, the first two being his most important contribution to vertebrate biology. All of the aforementioned titles will be found in this Catalogue.

The progress of zoological observation from Ray to Linnaeus was marked by the vigorous labors of many scientific investigators, among them Woodward, the paleontologist; Hans Sloane and Rumphius, collectors; Alex. Monro and Shaw (1692-1751), travellers; Réaumur, the entomologist and Peyssonel, Linck and Lhwyd, students of fishes.

A classic treatise on zoology was the Onomasticon Zoicon of Walter Charleton, the first edition issued in 1668, followed by several others before 1680.

An early British local faunist was Joshua Childrey who wrote in 1661 Britannia Baconica, or Natural rarities As they are found in every Shire.

Of the bountiful literature of this period the Compiler can mention only a few titles.

La Caccia dell' Archobugio (Bologna, 1672) of Vita Bonfadini is an illustrated 12mo of 96 pages that not only gives directions for hunting various animals with the arquebus but also describes quite carefully the hunted birds and mammals.

An important, early contribution to comparative anatomy was Samuel Collins's A systeme ..... treating of the Body of Man, Beasts, Birds, Fish, etc., 2 vols., illustrated, London, 1685.

The Ichthyographia (London, 1685) of Francis Willughby, folio, with many plates of fishes and an elaborate title-page, forms a most important atlas of piscine literature which should be in every zoological library. It has also a decidedly human interest, the full-page plates being dedicated to various well-known members of the Royal Society, among them Christopher Wren and Samuel Pepys, the diarist.

Johannes Jonstonus, or plain John Jonston, although born abroad in 1603, was of British descent, and ~~was~~ a student at St. Andrews. After many years of research at various continental universities he returned to England, but again set out on his travels, graduated as a physician, and finally settled in Silesia. A brief notice is given in this Catalogue of his great zoological encyclopedia, alphabetically arranged, ~~and~~ a rival of Gessner's heavy tomes. This is the Thaumatographia naturalis in decem classes distincta, 1633, in which he describes the marvels of the natural world. Five of the six books are devoted to man, ~~and all the~~ the remainder to other animals. We may without hesitation bracket this immense work with the treatises

of Aldrovandus and Gesner, and note that successive editions were translated ~~in~~ into Dutch and (the Birds) into French. The artistic plates ~~also~~ display, as a rule, German synonyms; ~~and~~ the text matter shows generally a decided scientific advance over previous writings on the various subjects – on the fishes in particular.

Because he occupied a prominent place on the roster of seventeenth-century faunal encyclopedias one must speak of Edward Topsell, ~~whose~~ and especially of his Historie of Foure-footed Beasts, 1607, and the Historie of Serpents, 1607, ~~have already been noted.~~ Most editions of these cyclopedias are listed in our Catalogue.

Attention should also be given to Giovanni Germano, who, in 1625, wrote a Breve e sustiale trattato ... delli piu principali animali ... con il corpo humano, etc., illustrated with 12 copperplates of osteologic subjects, monkey, dog, cat, several birds, bat, man, et al. The writer was a Provencal

Minorite friar, author of several works on anatomy and surgery. The present volume is very rare and is counted among the earliest works on comparative zoology.

Much later, of course, and more complete, but bearing on the same subject, is S. Berthelot's two-volume Oiseaux voyageurs et Poissons de Passage, étude comparee d'organisme, 1875-6.

Contemporary with Germano's treatise there appeared two rare works — H. von Hoevel's Neuwer wunderbarlicher Thiegarten, etc., Frankfurt a.M., 1601, and Johann Sperling's Zoologia physica, 1661. The latter, edited and published after the author's death by G.G.Kirchmaier, exhibits original thought and is an effort to furnish a more rational classification of animals than had hitherto been attempted.

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In 1595 the pastor H.H.Frey published his Biblisch Thierbuch, etc., now a very rare book, in which he shows us that God has given us animals for other purposes than food, sport and game; for companionship, as teachers of morality, and so on. It was a new dogma and one feels like commending its perusal to a certain class of Christian "sportsmen" of our own day, many of whom would be the better of a book on the rights of animals.

We find an extension of the teachings of Frey in the treatise of Wolfgang Franz (Historia animalium sacra, 1612) that has been reprinted and translated many times. An English edition appeared in London, 1670. In addition to his recognition of the habits and domestic life of our animal brothers he proposes a rational system for their classification. As for "dracones" he says, with much spirit and truth, "the principal dragon is the devil."

and popular)

A more complete (sacred natural history is the famous Hierozoikon of Samuel Bochart, London, 1663, several subsequent editions of which were published elsewhere.

~~An echo of such works is a study of the animals in Noah's ark (Arca Noë, Amsteld., 1675) by Athanasius Micherius, albeit of little value from the scientific viewpoint.~~

The encyclopedic period produced a number of other treatises, only a few of which will be mentioned here. One of these is often quoted - Daniel Sennert's Epitome naturalis scientiae, 1618. This author was a professor of medicine in Wittenberg, and attempted a crude classification of animal life. Earlier but not less important is the Exotericarum exercitationum Liber XV, Paris, 1557, of J.C.Scaliger, who notes many original observations of animal habits. Of some slight value, also, is the rare Historia Naturae of Nieremberg, 1635, divided into 16 "books", after the ancient style.

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Illustrations of zoological works by copper, steel and wood engraving soon became common enough, and during this period numerous examples appeared of designs by artists famous in other departments of art - Nicolas de Bruyn, C.J. Visscher, Adrian Collaert (or Collard), Adrian Bloemart, Saint Lucas, Albert Flamen and Antonio Tempesta, most of whom are pepresented by titles in the McGill Libraries.

Reference has several times been made to early zoological observations found in treatises on medical zoology, i.e. on animal products as remedial agents in human therapeutics. Quite frequently discoveries in faunal and floral life made by early voyagers to the New World were confined to this category, incidentally noting facts of some value in comparative zoology and other sections of biology. Among these are books published by ~~Clusius (L'Enclose),~~ Oviedo (Summario ... ... dell' India occidentali, 1535); José d'Acosta (Histoire naturelle des Indiens, frequently translated, ~~and published~~ ~~first~~ 1st edition, 1590, Seville); Francesco Hernandez, physician

to Philip of Spain, author of very important and well-known Americana (treatises on Central American flora and fauna) 1628-1651; N.A.Recchi, another physician whose contributions to zoological history are enrolled in this Catalogue; the list ending with the works of still another physician, Guil. Pison, whose Historia naturalis Brasiliae and other ~~treatises~~ works on the same subject (1648-1658) are familiar to ~~many~~ students of natural history.

Later, the Abbé Molina wrote his classic study of the Natural History of Chile, the first edition of which was published at Bologna in 1782.

~~This may be an appropriate place to say something about the progress of ornithology and its literature from the sixteenth to the twentieth century.~~

As previously mentioned, the same year (1555) that saw the appearance of Gesner's Historia Animalium, including a discourse on ~~birds~~ birds, witnessed the publication of an illustrated Histoire de la nature des Øyseaux, by Pierre Belon (1517-1564). This writer's descriptions of birds were distinguished chiefly by an unusual attention to their internal structure as well ~~as to~~ by a description of their external appearances. ~~In this connection he~~ He also compared avian with human structures and thus became one of the first of the comparative anatomists. Belon's works did not slavishly follow tradition; ~~so that~~ hence he avoided much of the medieval absurdity expressed in ~~most~~ many earlier and ~~many~~ Some later publications. He adopted also a definite taxonomy, ~~portions~~ parts of which survive to the present day.

Newton (Dictionary of Birds, p.6) speaks very favorably of the next important name on our list, that of Volcher Coiter, who published at Nürnberg in 1573 and 1575 two tractates, embellished with well-executed cuts, in which the histology of bird structure is quite well described.

A physician named Caspar Schwenkfeld published at Leignitz in 1603, a volume called Theriotropheum Silesiae in which over 100 birds are described so accurately that they are readily identified.

It was in 1680-1 that Giovanni Borelli's de motu animalium appeared. This first edition (in the Blacker Library) is extremely rare, no copy being listed in the British Museum Catalogue (Nat. Hist.).

It was not until 1666 that Christopher Merrett printed the first edition of his Pinax rerum naturalium Britannicarum, a work of importance as it touched many sides of natural history.

In 1684 Sir Robert Sibbald published his Scotia illustrata, in which many of the fauna and flora of Scotland were depicted and described.

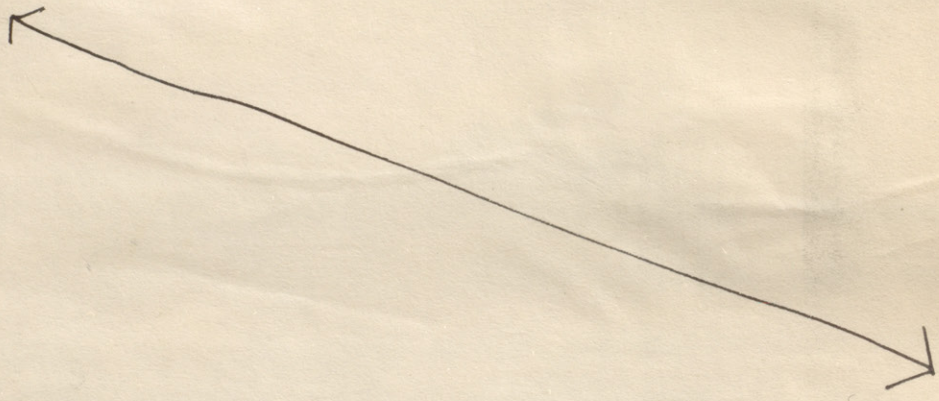
Despite the preponderance of medieval and other early books on the subject, mammology pure and simple has not, on the whole, excited as much literary interest through the ages as ornithology and probably not much more than ichthyology. As a consequence the treatises and periodicals on the first subject do not bulk as large on the shelves of most libraries devoted to natural history as do works on bird lore.

Ruminants naturally attracted the attention of early writers on domestic and general zoology. Johannes Aemylianus Ferrarensis in 1584 wrote a partial treatise on the subject while J. Geo. Agricola published two editions (1603 and 1617) on the deer and its use in medicine; and there are many others.

The horse and his allies have a still greater monographic bibliography to their credit; many are the tractates dealing with equine anatomy and therapeutics. Several early Persian MSS and printed books in the Blacker Library deal with this subject. In 1598 Carolo Ruini wrote a Book on the Horse that ran into several editions. The wild zebra was described about the same time by the voyagers Pigafetta and Thévenot.

Monographs on special zoological subjects began to appear at a relatively early date. We cannot do more than mention a few of the more important. Nicholas Tulp, Dutch physician, first described (Observationes medicae, 1641) the chimpanzee and other hitherto unknown animals; Wolfgang Waldung (Lagographis, etc., 1619) gave us an illuminating account of the biology of the hare; Jacob Thomasius furnished the first scientific account (De Visu Talparum, 1659) of vision in the mole; Olaüs Worm wrote a monograph (Historia animalis quod in Norvagia, etc., Hasniae, 1653) on the lemming, with anatomical figures; and there were published volumes too numerous to mention of such domestic animals as the dog and cat, ~~although one may expect~~ a most interesting and important treatise being the original and admirable English monograph on the dog by John Caius (1510-1573), various editions of which are shelved in the Blacker and other libraries of McGill. From the earliest times, ~~and~~ by Persian, Indian and European authors, the elephant ~~was~~ has been a favorite monographic subject, ~~Moreover~~, Justus Lipsius, Gaspard Horn and Joachim Praetorius, following the good example set by Petrus Gillius, ~~also~~ described that hyderm~~the elephant~~ from personal observation.

There were several local histories published in America before 1700 that contain a few allusions to the fauna of the continent but these, in an elementary treatise like the present, may be ignored.



~~The first work of any importance, i.e. listing any considerable fraction of the faunal life of the United States, is John Lawson's Description and Natural History of North Carolina, that went through several editions.~~ Mark Catesby's

Among the important seventeenth-century writers on neotropical zoology, ~~of the early seventeenth century~~ some of whom have already been mentioned, was George Marcgrave, who wrote much of the natural history portion of Johan de Laet's Novus orbis .... libri XVIII, Lug. Bat., 1633. This important and well-trained medical mathematician contributed much to our knowledge of the early zoology of South America.

The medical profession is further represented by several early adventurers to the New World, one especially deserving of mention, Jacob Bontius, (1599-1631), a native of Holland, whose Histoire Naturelle (1658) was published by Pison, (q.v.). His explorations extended far afield as he also describes both the Mauritius Dodo and the Orang of Borneo.

CHAPTER IV.

The Literature of Comparative Zoology. The Systematic Classification of Vertebrates. Darwinism, its Literature, its Advocates and its Critics.

Galen — Vesalius — Ambrose Paré — Riolanus — V. Coiter — Fabricius ab Aquapendente — Severinus — Malpighi — Thos. Willis — Leuwenhoeck — Geraard Blaes — F. Redi — M. B. Valentini — Pieter Camper — Alex. Monro — John Hunter — B. W. Hawkins — J. Leidy — Wiedersheim — W. N. Parker — C. A. Rudolfi — J. F. Meakel — Ducrotay de Blainville — Siebold and Stannius — A. A. Retzius — Everard Holmes — G. Germano — H. Milne (hyphen) ↓ Edwards — St. George Mivart — Arnold Lang — J. W. Papez — R. W. Shufeldt — W. His — K. E. von Baer — H. C. Pander — E. R. Lankester — Charles Darwin — E. Häckel — Kölliker — Remak — Anton Dohrn — G. Rolleston — G. J. Romanes — A. R. Wallace — Thos. Huxley — Edward Newton — Asa Gray — Herbert Spencer — H. W. Bates —

Thos. Belt — C. Gegenbaur — E. Selenka — A. Willey —
M. Fürbringer — The van Benedens — A. G. Butler —
Ramon y Cajal — Altum and Landois — E. B. Poulton —
Romanes — E. Forbes — A. Sedgwick — E. Forbes —
Gwyn-Jeffrys — Quatrefages — Alex. Agassiz —
John S. Kingsley —
Wyville Thompson — ~~Zoological Stations~~

Works on comparative anatomy and zootomy are fairly represented in this Catalogue. The earlier theses were mostly the records of work done by medical men who when interdicted from the dissection of human subjects turned to the lower animals for information on anatomy, physiology and even psychology. Such authors and titles on comparative biology as are not catalogued here will usually be found in the Bibliotheca Osleriana.

~~Drawing conclusions from~~ Zootomy and live animals experimentation are, as everyone knows, among the most valuable life-saving and productive present-day laboratory research works man can undertake. ~~Practical~~ Preventive and curative medicine, zootomy and zoophilosophy still march hand in hand, a procession, albeit of meagre proportions as it began its journey with the first dawn of history.

In practice it ~~began~~ commenced with Aristotle, Galen, Vesalius, Ambrose Paré, Eustachius, Fallopius, Riolanus and many other names famous in medico-zoological literature. One notes that Volcher Coiter (Koiter, Koyter ar Coeiter) a Nuremberg doctor (already mentioned) presented almost the first important work on comparative anatomy, some details of which will be found in the annotated list of this Catalogue. The name of a contemporary of Coiter, Fabricius of Aquapendente, may properly be bracketed as the founders of comparative anatomy.

Mention has been made of Marcus Aurelius Severinus (1580-1656), professor of anatomy and surgeon at Naples. He wrote the first systematic treatise on comparative anatomy (Zootomia Democritaea, etc., Norimberg, 1645, edited by J.G.Volckamer) entirely devoted to that subject. He made an effort to free his writings from the myths and doubtful observations of animal life that had ~~gathered~~ accumulated in the literature of preceding centuries.

The discovery of the New World and its explorations furnished during the succeeding centuries many hitherto unknown specimens and much literary matter descriptive of animal forms. It was about this time also that certain early ~~medieval~~ anatomists contributed accounts of their labors to the progress and history of comparative zoology. The chief of these, in addition to Fabricius and Severinus, were Harvey (1578-1657); Malpighi (1628-1694); Tyson (1649-1702); Swammerdam (1637-1680) and Hook (1635-1702), all of whose writings are represented in the accompanying Catalogue.

Thomas Willis (1621-1675), Oxford professor of physics, is in some respects more important as a zootomic writer than most of his contemporaries, and his De anima Brutorum, London, 1672, must be mentioned here. Despite his false notions on the psychology of the (so-called) inferior animals, he is worthy of a place near the immortal Harvey.

The literature of comparative embryology is essentially modern and rests mainly upon microscopical observations, and yet, like other departments of zoology, it had its early beginnings. For example, Petrus Rommel wrote De Foetibus leporinis extra uterum repertis, Ulm, 1680, and made sensible (comparative) comments thereon; and there are many other similar allusions in 17th. and 18th. century literature to this important science.

In the hands of Malpighi, Leuwenhoeck, and a host of later investigators the use of the microscope introduced scientific investigators to an entirely new world of scientific research. ~~in all literary territory.~~

As Victor Carus points out, the employment of alcohol, instead of the old methods of drying, rubbing with powders, etc. for the preservation of zoological specimens, greatly increased the number, variety and value of museum collections everywhere and measurably advanced science.

Comparative anatomy thus encouraged advanced apace and numerous additional monographs on zootomy appeared - as the Compiler has already mentioned. A rather early and important treatise of this kind is the Anatomia animalium (Amsterdam, 1681) of Geraard Blaes, preceded in 1673 by the less important Miscellanea anatomica hominis brutorumque, etc., containing not only the writer's original observations but (illustrated) excerpts from other authors.

Among the brilliant comparative anatomists of the early eighteenth century was Francesco Redi whose ~~seven~~-volume Opere, largely devoted to natural history, were published in 1712-30.

Another work of much the same scope is the Amphitheatrum Zooticum of M.B.Velentini (1657-1729), professor of medicine in Giessen, almost an encyclopedia on the subject, ~~which is~~ and to-day useful as a work of reference. The figured anatomy of the American opossum and of many other interesting vertebrates is given; indeed this extensive work furnishes the best compendium of the numerous writings on comparative anatomy that appeared during the eighteenth century.

Reference to the literature of comparative biology (especially zoology) and its literary expositors shows that the labors of early (eighteenth century) writers on and investigators of lower animal anatomy uniformly improved upon the activities of their predecessors. Among these later scientists are J.N.Lieberkühn, Pieter Camper, John Hunter and Peter S. Pallas.

Peter Camper (1722-1789) was born at Leyden, graduated in medicine and lectured at several Dutch Universities. He is best known as the forerunner of modern craniology - Camper's facial angle is still in common use - and as a comparative anatomist who dissected the orang-utan and other higher apes and discoursed upon their comparative anatomy. He also published monographs on avian osteology, the structure of the ear in reptiles, fishes and whales, and on the anatomy of the reindeer, elephant and rhinoceros. He it was who, after a study of the anatomy of the human foot, condemned the footware of his period and suggested improvements on it.

In this connection, an early, noteworthy "Arbeit" is J.F.Meckel's elaborate and well illustrated anatomy of the Duck-billed Platypus, 1826, in which a famous surgeon describes the flippers of this faunal paradox. An earlier work by Alex. Monro (1785) compared the structures of fishes with those of man and other animals.

Although they exercised some influence on the progress of comparative anatomy the specific writings of Felix Vicq d'Azyr (~~f~~ nat. 1748) and of his teacher Condillac (1715-1780) can have only a bare mention here.

We have had frequent occasion to speak of John Hunter but it is well to refer once more to that famous surgeon and naturalist. His father was a poor Scotch farmer. After a hard struggle to secure an education Hunter settled in London and devoted his time and energy to ~~from~~ surgical practice, to anatomical studies and to the establishment of the magnificent museum that is still the pride of the Royal College of Surgeons. Osler quotes an opinion of this remarkable genius from Buckle's History of Civilization in England :- "He was one of those extremely rare characters who only appear at very long intervals, and who, when they do appear, remodel the fabric of our knowledge. They revolutionize our modes of thought; they stir up the intellect to insurrection; they are the rebels and demagogues of science."

Hunter's treatises on comparative anatomy show much originality of thought and are probably the most important contributions to the subject made during the eighteenth century. Of these works his Observations on certain parts of the Animal Oeconomy, 1786, has been several times reprinted and many times made the subject of comment and review.

Of the many other contributions to the subject our own Agassiz has written a monograph well worth the attention of the student, The Structure of Animal Life - six lectures delivered in 1866.

A minor contribution of some value is T.C.Eyton's Osteologia Avium, a 4to., with 113 plates. A more important ~~such more recent~~ treatises is B.W.Hawkins' Comparative Osteology, an Atlas prepared under the supervision of Prof. T.H.Huxley in 1864.

Among the long list of modern American teachers of paleontology and comparative anatomy stands the prominent figure of Joseph Leidy. One of his best known contributions to the former was his Ancient Fauna of Nebraska, 1854.

Among modern writers of text-books on comparative anatomy none is surpassed by R.E.E.Wiedersheim, a translation of whose best edition (1886) was made in 1897 and in 1886 by the American zoologist W.N.Parker. The original work and its translations have passed through many editions.

Among the followers and successors of Cuvier, especially in the realm of comparative anatomy, was Carl Asmund Rudolphi (1771-1832) who, apart from his researches on parasites and his large work on general physiology (never completed), gave some attention to vertebrates, their cerebral and digestive organs, etc.

Even better known than Rudolphi was Johann Friedrich Meckel (1781-1833) whose studies in comparative anatomy are set forth in his System der vergleichenden Anatomie. He also developed a theory of evolution worthy to be mentioned with that of Lamarck, Wallace and Darwin.

Among the early nineteenth-century exponents of comparative biology in France may be mentioned Henri Marie Ducrotay de Blainville (1777-1850). A native of Normandy and an enthusiastic pupil of Cuvier, he developed into a brilliant writer and teacher of the biologic sciences. He is best known in this connection by his Osteographie (on fossil vertebrates) and his De l'organisation des Animaux.

~~Contemporaries of Müller and Owen were~~ Karl Theodor von Siebold (1804-1885) and Friedrich Hermann Stannius ~~were~~ collaborated to write a well-known treatise - it is something more than a text-book - a Lehrbuch der vergleichenden Anatomie, 1846, in which Stannius describes the vertebratae and Siebold the invertebrates. In this work especial attention is given to microscopical anatomy, in contrast to other pretensious works of the kind in which morphology is more or less neglected.

The pioneer comparative biologist of Sweden, as well as one of her foremost naturalists, was Anders Adolf Retzius (1796-1860), born in Lund. He studied under the foremost teachers of the day; indeed his work (and reports of it) on the Myxinoidie formed the basis of Johannes Müller's celebrated treatise, while his researches in anthropology are written into the records of modern craniologic terminology.

The anatomy of animals per se has a considerable literature of recent date, only a part of which can be mentioned here. Most authorities claim that Gerard Blasius (Geraard Blaes) was probably the first to publish an extensive work on the subject (Anatomia animalium, Amstel, 1681) made up of his own observations and illustrations incorporated with extracts from Malpighi, Willis and others, ancient and modern.

The Blacker Library has, however, come into possession of a still earlier and much rarer folio than that of Blasius, which in the opinion of others is the first scientific work on comparative anatomy, viz: Giovanni Germano's (fl. 1620-74) Breve e sustatiale trattato ... delli piu principali animali ... con il corpo humano, etc., Napoli, 1625, Illust. The writer was a minorite Provencal friar, author of several other works on anatomy, and surgery.

That excellent work by Pander and Alton, the well-illustrated Vergleichende Osteologie (1821-38) in ~~two~~ 2 volumes, every good research library should possess, ~~albeit a treatise~~

More recent essays and treatises are accessible in considerable numbers. Among them is Sir Everard Homes' Lectures on Comparative Anatomy, 4 vols. (1814-23), and Supplement (1828), 2 vols., well illustrated and of great value to the student.

Another excellent and more modern work is George Rolleston's Manual of Comparative Anatomy, the second edition of which appeared in 1888. ¶ Among important writers on the comparative anatomy of vertebrates (and of fauna in general) was John Sterling Kingsley, especially his Comparative Anatomy of Vertebrates, 2nd. ed., 1917.

A later treatise is that of M.B.Valentine, professor of medicine at Geissen, mostly on zootomy. This Amphitheatrum zooticum, besides his own record of work, figures many careful dissections performed in the laboratories of Paris, London, Germany and Denmark, and is a usual compend, surpassing in value even the large encyclopedia of Blasius. It was published at Frankfort in 1720, reprinted in 1742 under another title, and furnishes an excellent review of the state of comparative histology and gross anatomy at the beginning of the eighteenth century.

Of Henri Milne-Edwards (1800-1885) the Compiler has already written. It may be added here that he was a native of Belgium but of English origin. A pupil of Cuvier, he came when quite a young man to Paris and became a professor there. In a treatise on the crustaceae he worked out a system of comparative anatomy that still stands as a model for research students in zoology and other departments of biology.

Among the popular modern writers on comparative zoology was the celebrated Sir W.H.Flower. Of his many contributions to this department of natural science one thinks shiefly of his Introduction to the Osteology of the Mammalia (1870) whose third edition (1885) was written in collaboration with Hans Gadow.

There is not room at this time to do justice to the comparative and other natural history studies of St. George Mivart (1827-1900), some of whose works have already been mentioned and nearly all of whose treatises on vertebrate zoology are in the McGill Libraries.

Of College text-books the Compiler thinks very favorably of Arnold Lang's Comparative Anatomy, ~~of which a good translation was~~ (the English edition published in 1891-96) with a preface by Ernest Haeckel.

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The science of embryology in the modern sense is a late development of scientific research. One of the earlier devotees of this branch of biology was Karl Ernst von Baer (1792-1876), a native of Esthonia. A good account of this erudite teacher and of his life and writings is given by Ludwig Stieda (q.v.). Baer's De ovi mammalium genesi, 1827, Ueber Entwichelungsgeschichte der Tiere, 1827, and 1837, are well-known to advanced students. In these treatises Baer considers at length the development of the ovum in vertebrates.

Baer's successor at the University of Königsberg was Martin Heinrich Rathke (1793-1860), born in Dantzig. In his tractate, Ueber die ruckschreitende Metamorphose he records the results of his researches in comparative embryology. He also wrote quite a few monographs on the vertebrates and on marine zoology.

Another pioneer (and associate of von Baer) in embryology was Heinrich Christian Pander (1794-1865). He was born at Riga of wealthy parents and was able to give him whole attention to his favorite study. His treatise, Vergleichende Osteologie, did not attract as much attention as his purely embryologic works.

Francis Maitland Balfour (1851-1882) the brilliant younger brother of the celebrated Lord Balfour, whose early death, the result of an accident, cut short a most promising career, wrote a number of monographs - one on the development of sharks - but he is best known to science as the author of A Treatise of Comparative Embryology, that furnishes the development of the embryo throughout the whole animal kingdom.

In 1929 was published an excellent treatise of 544 8vo, octavo pages, on Comparative Neurology by J.W.Papez. It is a well illustrated text-book dealing entirely with the brain and nervous system of the vertebrate classes and will be found extremely valuable to advanced students.

Very useful anatomical monographs on birds have been written by R.W.Shufeldt (q.v.) especially his Myology of the Raven, New York, 1890.

A Swiss embryologist of note was Wilhelm His (1831-1904), born in Basel, where he became professor of anatomy before he was translated to Leipsig. He wrote, among other works, Unsere Körperformen, Leipzig, 1874. A complete biography and bibliography of this naturalist has appeared in the Anatom. Anzeiger, vol. 25, pp. 161-208.

Another embryologist with a German name born outside the Fatherland is Alexander Wilhelm Goette (1840-1922) of St. Petersburg. He finally became professor in Strassburg. His chief work on vertebrates is Die Entwickelungsgeschichte der Unke (Bombinator igneus.)

Of importance in this review of zoological literature are the writings of Oscar Hertwig (1849 - 1921) and his brother Richard (1850 - 1920), born in Friedberg-in-Hesse. The latter became professor of zoology in ~~[illegible]~~ Munich, Oscar of anatomy in Berlin, and they both carried on valuable and original researches in embryology, including the development of the vertebrata. Oscar's Allgemeine Biologie (many editions, the 4th, Jena, 1912) and Richard's Lehrbuch der Zoologie, Jena, 1890, are classic text books.

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Much work on the embryology of vertebrates has been done in England. Prominent among these investigators is Edwin Ray Lankester (1847-1929), whose literary output has already been noticed. He gave much attention to papers dealing with the evolution of the articulata and pisces.

Darwin has been mentioned in several connections. It may be added here that Charles Robert Darwin (1809-1882) was born in Shrewsbury and married his cousin, daughter of the celebrated porcelain factor, Josiah Wedgwood. After a partial training in those rather opposed studies, medicine and theology, he interested himself chiefly in geology under Professor Adam Sedgwick. In 1831 he accompanied the "Beagle", as unpaid naturalist, on her famous voyage round the world, and his scientific fortune was made. Despite the ill-health that followed his retirement Darwin, then in affluent circumstances, worked persistently and chiefly on the evidence that supported his theery of evolution, the printed records of which immortalized his name. Although one does not find among Darwinia many purely zoological titles yet every student of the vertebratae and their literature should carefully read all the well-known works of Darwin on biology, especially his account of the "Voyage of the "Beagle", just as one would absorb

the Natural History of Selborne by another famous author who, in accord with the spirit of the modern scientist, "kept his eyes steadfastly fixed on the truth, never casting side glances at the safety of his soul."

Darwin soon had arrayed for and against him all the cohorts of the Church and many devotees of Science, the result being, inter alia, the publication of an immense mass of literature, generally controversial, most of which it is not the purpose of the Compiler to mention or catalogue, although a few of the more important, as they relate to vertebrate zoology, are on our list. It may be said, finally, as a solitary comment on the subject and as a side-light on the spiritual poise and rare probity of the great naturalist, that the most valid objections to the conclusions of the Origin of Species are stated in the pages of that famous treatise.

~~The epoch making works of Darwin were followed by a world of zoological literature, enthusiastically endorsing, criticizing or modifying the doctrine of evolution.~~ Prominent among the ~~first of these~~ advocates of the Darwinian theory was Ernest Hackel of Jena who, ~~seven~~ years after the appearance of the Origin of Species, published his Generelle Morphologie, 1866. Two years later appeared his Natürliche Schöpfungsgeschichte emphasising the extreme value of embryology as a guide to the development of species, classification and nomenclature.

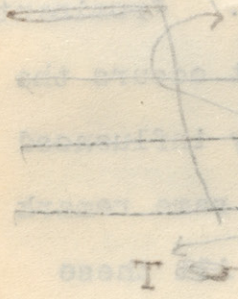
Early in the discussion of evolutionary schemes appeared Steenstrup's remarkable Alternation of Generations. See the Ray Society's reprint, 1845.

The epoch-making work of Darwin was followed by a host of geological literature, continually accumulating, [illegible] corroborate the doctrine of evolution. Prominent among the champions of Darwinian theory was Ernest Haeckel of Jena who, [illegible] years after the appearance of the Origin of Species, published his Generelle Morphologie, 1866. Two years later appeared his Natürliche Schöpfungsgeschichte emphasizing the extreme value of embryology as a guide to the development of species, classification and nomenclature.

Early in the discussion of evolutionary schemes appeared Steenstrup's remarkable Alternation of Generations. See the Ray Society's reprint, 1845.

Mention has been made of the fact that German investigators were ~~at this time~~ in the forefront of zoological research and literary production, and the names of ~~Von Baer~~ Kölliker, Remak and Kowalesky must be added to the foregoing list. ~~Prominent among the students of cell structure and development occurs the name of F.M.Balfour, whose work (1873-82) profoundly influenced the fashionable classification of the day; and the same remark applies to the (later) writings of Ray Lankester.~~ These authors writers and several of the following took part in the discussion of the doctrine of evolution.

~~About this time two other noted German zoologists came into prominence, Fritz Müller and Anton Dohrn, the latter Director and founder of the Aquarium at Naples.~~



Another prominent and voluminous writer, especially on vertebrate fauna, is P.L.Sclater, who especially distinguished himself (in 1857) by correlating the known facts of the geographical distribution of animals.

In 1836 Henry Doubleday published a systematic list of British birds as a contribution to zoologic nomenclature. The original edition of this monograph is very rare, "wanting" in the British Museum Catalogue.

A note must here be made of David W. Mitchell's Genera of Birds in 3 volumes, 1844-49, written in association with G.R.Gray.

An essay of importance from the evolutionary viewpoint is W.A.Herdman's Phylogenetic classification of Animals, 1885.

Because of its anatomical basis one must not forget George Rolleston's Forms of Animal Life, Oxford, 1870.

This is not the place to do more than refer by name to even the other prominent ~~numerous~~ writers (and their publications) that have added to the literature of evolution; especially in Germany "Darwinismus" was and is regarded as part of the teachings of those Natur-philosophen that include, with many others, the English naturalist, Erasmus Darwin, (1731-1802); Lamarck (1744-1829); Geoffrey Saint-Hilaire (1722-1844); Oken (1799-1851); Goethe (see his Zur Natur und Wissenschaft, Stuttgart, 1817), and Treviranus (Biologie, 1802-05).

One of the minor opponents of the Darwinian theories was Wm. Bateson, a believer in the "discontinuity of variation" who, in 1894, wrote his Materials for the Study of Variation, etc.

While the original doctrine of evolution (especially its principle, the survival of the fittest in the struggle for existence) will require modification in the light of ~~present and future studies~~ modern biology, its literature still remains as one of the most important parts of zoological studies, the chief titles of which will be found in the present Catalogue.

¶ Among the opponents and critics of the Darwinian theory that have contributed noticeably to biological problems and their literature one may mention Richard Owen, Kölliker, Agassiz, Albrecht Wigand, von Baer and Quatrefages de Bréau, with a passing reference to such ~~zoological~~ scientific weaklings as S. Wilberforce, Bishop of Oxford, who may be regarded as the representative of that numerous array of theologians who hastened to don the ancient panoply of ecclesiastic warfare in defence of their medieval science. One of the best expositions of Darwinian theories is G.J.Romanes' Darwin, and after Darwin, 1892-97, in ~~three~~ 3 volumes.

Of the many men of scientific attainment who became advocates and exponents of the theory of evolution in its several phases first place must be given to Alfred Russell Wallace, by many believed to be the co-discoverer of the great theory. Associated with him were such authorities as Lyell, Thos. Huxley (whose numerous contributions to the various departments of vertebrate zoology are listed in the Catalogue), Edward Newton, Asa Gray,

Radl, Sir Joseph Hooker and Herbert Spencer; ~~and Haeckel;~~ indeed, both in England and in Germany - the two centres of biological progress - evolutionary theories and hypotheses were for many years dominant subjects of discussion in natural science.

Perhaps as good a recent review of the various branches that have grown out of the large trunk of Darwinism is Professor George Dorsey's The Evolution of Charles Darwin, 1927; but there are dozens of other similar studies, many of them more elaborate and profound, ~~than~~ few of which can be mentioned here.

The centenary of Darwin's birth and the fiftieth anniversary of the publication of the Origin of Species was commemorated by the printing of a series of Essays edited by A.C.Seward, Cambridge, 1909.

A companion of A.R.Wallace in a journey round the world was Henry Walter Bates (1825-1892). After a year of exploration Wallace returned to England, later to make his famous journey to the East Indian archipelago and to write the classic volumes listed in this Catalogue. Bates remained in Brazil and subsequently wrote that fascinating story, The Naturalist on the River Amazons, the first edition of which (in 2 vols.) was published in 1865.

Wallace made many contributions to zoology, a most important one being the account of his discoveries in animal geography. He was, in fact, a principal pioneer in the study of animal distribution on the earth's surface. It was the treatise that he wrote on the disposition of faunal life in Borneo, Lombock and the Celebes, and which he submitted to Darwin, that impelled the latter to make a simultaneous reading before the Linnean Society in 1858, of his own and his friend's views on animal and plant struggle for existence and its effects on the origin and specific history of floral and faunal forms.

Thos. Belt in his Naturalist in Nicaragua, 1874, also furnishes many germane observations on animals and plants in reference to the theory of evolution.

Carl Gegenbaur (1826-1903), a well-to-do graduate in medicine and pupil of Virchow, taught in Heidelberg most of his mature life. Here it was that he wrote his text-books, the Grundriss and Grundzüge d. vergl. Anatomie, 2 edns., 1859 and 1874, Leipzig. He worked in all the biological fields but towards the end of his career devoted himself to the vertebrata, especially to their embryology and comparative anatomy, as brilliantly exposed in his Untersuchungen zur vergleichenden Anatomie der Wirbeltiere, 4to., Leipzig, 1864-72. Still later he completed the celebrated Vergleichende Anatomie der Wirbeltiere, (in several editions, 1898 and 1901 among them), which summed up the labors of a life-time. This elaborate work served for a full generation as the text book of what may be termed the (modern) Gegenbaur school of comparative anatomy.

The best known pupil and follower of Gegenbaur was Max Fürbringer (1846-1920) who followed his teacher from Jena to Heidelberg as prosector. He published a number of monographs, and will long be remembered by ornithologists for his monumental Untersuchungen zur morphologie und Systematik der Vogel, 2 vols., 1888. This remarkable study of avian anatomy is an enduring

superstructure built on the firm foundation of morphological research and it forms the basis of a rational classification of birds now universally accepted. This monograph also forms an important part of the indispensible Bronn's Klassen u. Ordnungen des Tierreichs, Vols. VI, Abt. 1-5 of which is wholly given up to the morphology of the vertebrate sub-classes.

2.a

That career of that brilliant apostle of monism and versatile exponent of the Darwinian philosophy in certain of its phases, Ernst Heinrich Haeckel (1834-1919) was born at Potsdam. After a thorough grounding in biology (mostly under Hohannes Müller) and medicine, he was, in 1862, called to the chair of zoology in Jena and held it until 1909. The influence of Haeckel on the progress of biology has been immense. Although he devoted most of his time and energies to research involving only the invertebrata his Generelle Morphologie der Organismen, 1866, and other works affect higher organisms more deeply than many a treatise with a purely zoological title. His extremely popular Naturliche Schöpfungsgeschichte, 1868, known to English readers through the ~~widely read~~ translation "History of Creation".

As a comprehensive and very important contribution to the embryology of vertebrates the student should know E. Selenka's Studien ueber Entwickelungsgeschichte der Thiere, in five volumes, 1883-92, continued after the author's death by several colleagues.

Modern instances of studies in faunal development may be found under the (present Catalogue) titles by Arthur Willey, professor of Zoology in McGill University, among them Amphioxus and the Ancestry of the Vertebrates, 1894, with a preface by H.R.Osborn; ~~and~~ various captions (also under) of the former's Zoological Results, 1898-1902.

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The two (Belgian) van Benedens, father and son, demand some attention. The former, P.J.van Beneden, is the author, among other works, of a Histoire naturelle des Delphinides des mers d'Europe, 1889, 8vo, Bruxelles. The son - Edouard van Beneden (1845-1910) - was best known as a professor at Liege and the editor-published of the Archives de biologie. One of his earliest monographs is entitled Recherches sur le Signification de l'Oeuf, 1870.

A very useful handbook is A.G.Butler's How to Sex Cage Birds, 1907, a research in which Maud Knobel (q.v.) and others have long been engaged.

Although the numerous classes of specialists in modern cytology undoubtedly follow a most important and interesting branch of biology having zoological relations, yet, as previously stated, the Compiler feels that he must draw the line when it comes to giving a review of their literary productions. In this connection the

decided effect upon the progress of vertebrate zoology produced by the labors and writings of such tireless investigators as Bütschli, Flemming, Nägeli, ~~Vogt~~, William Bowman, Ramon y Cajal, Ehrlich, Nissl, Theodor Engelmann, Studnicka, F.C.C.Hansen (and fifty others) will be acknowledged at once by the advanced student, but the story of their lives and literary products must be left to the bibliographer - more diligent and competent than the Compiler - to do full justice to all the subdivisions of historical biology.

A well-known and useful work of reference for the student is Altum and Landois' Lehrbuch der Zoologie that has passed through numerous editions and translations, one of them quite recent and up-to-date.

Incidentally, attention may be drawn to a work on an important physiological subject, E.B.Poulton's Colours of Animals, London, 1890. The same author has collected and issued under the title of The Hope Reports (1897 - date) valuable extracts and reprints from various journals on biological subjects.

¶ One of the best known works on Animal Intelligence (and Behaviour) is the treatise of F.G.Romanes, 1883.

¶ Studies of marine fauna have already been mentioned. The ~~regular~~ use ~~of dredge and~~ as part of the equipment of Scientific expeditions has provided abundant material for such ~~workers~~ investigators and ocean dredge and trawl/ proved ters as E. Forbes, Gwyn-Jeffrys, Norman, W.H.Caldwell, Adam Sedgwick, Bateson, the two Sarassins, Quatrefages, Deniellson, Alex. Agassiz, Carpenter and Wyville Thompson.

VII

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CHAPTER ~~VI~~ V.

~~Travelogues of Explorers~~ ~~Reports of Voyages and Scientific Expeditions~~ Containing Descriptions of ~~Vertebrates~~ Journeys of Naturalists Round the World. Governmental and Private Surveys and Explorations.

John Josselyn — Jose d'Acosta — The Voyages of Capt. Cook — L. A. de Bourgainville — J. Byron — H.M.S. Hecla and Fury — The Uranie and Physicienne — H. M. S. Chanticleer — La Coquille — Voyage of the Astrolabe — H. M. S. Beagle — The Novara — Curaçoa — H. M. S. Alert — Challenger — Vega — Marchesa — Travailleur and Talisman — Wm Dampier — Geo. Bennett — Geo. Barrington — The S.S. Investigator — The S.Y. Scotia — Horn Scientific Expedition — Voyages to the antarctic of the Southern Cross and Terra Nova — Die zweite Deutsche Nordpolarfahrt — U.S. Exploring Expedition under Wilkes — Secnd Yarkand Mission — Felix de Azara — P. Sonnerat — Peter Pallas — A. von Humboldt — Voyages round the World — La Perouse —

~~U.S. Exploring Expedition under Wilkes~~ — Azara and Rengger in Paraguay — Alex. Humboldt — The travels of Prince Wied-Neuwied, Mikan, Natterer, J.B.Spix, F.B.Martius, Max Perty and Agassiz in Brazil — Reports of voyages to South America by d'Orbigny, Poeppig, Claude Gay, Tschudi, de Castelnau, Schomburgh, Burmeister, Louis Agassiz, Bates and Alfred R. Wallace — U.S. Astronomical Expedition to the Southern Hemisphere — E. H. Shackelton — La Belgica — Expeditions to Central America by Ramon de la Sagra, R. Schomburgk, Felipe Poey, Gundlach and Sallé — Early treatises on American Zoology by J.B. and Wm. Bartram, Thos. Jefferson, John Lawson, J. K. Townsend, B.S.Barton, R. Harlan, Gundlach, H. Sloane, J. B. Labat, R. Harlan, Audubon and Bachman, J.E.Holbrook, J.V.G.Smith, David Humphrey, Rafinesque-Schmaltz and E. Hitchcock — Gran Chaco Expedition — Natural History Expeditions to African Wilds — Voyages to Indo-China, Thibet, China and the South Seas — Scientific Explorations of South America, Alaska and Australia —

Precise identification of species as well as exactitude in describing them were greatly facilitated by the writings of those naturalist-explorers who collected specimens in their native habitat. These venturesome lovers of wild life, especially the early adventurers, who penetrated into unknown areas of mountain, stream and sea, often at the risk of their lives, deserve a fuller mention than can be given them here; indeed the Compiler regrets that limited space will oblige him to omit even a passing reference to many accounts furnished by voyagers over wide oceans and across continental stretches who gave reliable descriptions of fauna that have added measurably to the literature of zoology.

As will be further noted, nineteenth and twentieth-century travelers with some knowledge of natural history generally devoted a chapter or two to the fauna of the localities visited, and often furnished trustworthy lists of birds and other animals, the Keeton previously unknown to science. ~~many of these neglected scientific travelogues will receive some attention in the appended Catalogue.~~

As the Compiler's own continent was among the first to be systematically explored he will speak of some reports of travels in and of a few expeditions despatched to that quarter of the world.

The earliest English work on American natural history in general resulted from two visits between 1638 and 1671, made by John Josselyn. Several editions of his New Englands rarities, in the McGill Libraries, are of the greatest interest to the student.

Perhaps Josselyn was stimulated to give these experiences by the voyages of Jose d'Acosta, whose Historia natural de las Indias, etc., appeared at Leon in 1590, with an English translation, 1604.

One thinks naturally of the published explorations of the Hakluyt Society, of Captain James Cook, especially of the zoological observations of the latter made in H.M.S. "Endeavour", "Resolution", "Adventure" and "Discovery", and of a hundred other adventurers about which so many volumes have been written.

Although it is not the purpose of the Compiler to mention or attempt an evaluation of all the numerous naval expeditions (governmental and private) that, especially during the nineteenth century, engaged in every form of zoological research, it is thought desirable to draw attention at this juncture to a few not already described. The student will find a selection of these in the Index and a much larger and usually annotated list in the Catalogue, where they are entered under the name of the vessel or vessels engaged in the work, under the name of the commander of the expedition, under the name of the zoologist or zoologists on board, or under all three captions.

A famous early naturalist-explorer was L.A. de Bougainville whose Voyage autour du monde par "La Boudeuse et l'Etoile" 1766-69, was the first important expedition of his long career; another is the "Resolution" Voyages.

Among the early expeditions was also J. Byron's expedition in H.M.S."Dolphin", 1764-65, reports of which are given in several editions and their translations into foreign tongues, but perhaps the most important of the early nineteenth century voyages are the following :- that of the "Hecla and Fury", 1818-1828, W.E.Parry; of the French expedition in the "Uranie" and "Physicienne", 1824-26, associated by naturalists with the name of Louis de Freycinet; the voyage to the Southern Atlantic of Webster in H.M.S. "Chanticleer", 1828-30; the expeditions of the "King George and Queen Charlotte", 1826, in connection with which are coupled the names of George Dixon and Nathaniel Portlock; and of "La Coquille", Louis I, Duperry, 1826-30.

The famous voyage of the "Astrolabe", 1830-35, is intimately associated with the valuable scientific work of J.S.C.Dumont d'Urville who later (1842-54) made several voyages in the "Astrolabe" and "Zélée". Darwin's world famous expedition in the "Beagle", 1838-44, ~~we have already spoken~~ has already been mentioned.

These voyages and the reports on their zoological discoveries were followed in quick succession by many other important events of like character, e.g., the famous voyage of the "Thetis and Esperance" (1837) associated with the familiar name of Louis A. Bougainville; after which came the subarctic voyage of the "Recherche", then that of the well-known "Blossom", Capt. F.W.Beechey in 1839; then the second voyage of "La Coquille" in the same year, coupled on this occasion mainly with the fame of the ornithological and other reports of R.P.Lesson; also during 1839 the voyage of "La Favorite" and the name of C.P.T.Laplace. These were followed in 1841-52 by the expeditions and discoveries of "La Bonite" so well reported by the famous Auguste Vaillant; by the voyages (1843-44) of the "Sulphur" and Richard B. Hinds; by the valuable discoveries made by Arthur Adams and others during the voyage of the "Samarang", 1843-46, and the many adventures (1844-75) of the famous "Erebus and Terror" (already mentioned) under the scientific aegis of Sir John Richardson and John E. Gray.

In 1852 John Macgillivray described the birds of the "Rattlesnake" Voyage to New Guinea, etc.

Shortly before this a privately conducted expedition was made to the Far East (see Voyage dans l'Inde, ~~par~~ by Victor Jacquemont) whose zoological aspects were, in part, reported by Isidore Geoffrey Saint-Hilaire, while J.B.Juke's name is associated with the Voyage of H.M.S."Fly" during 1842-46, the Narrative dated 1847. Between 1846-55 took place the scientific expeditions of the "Venus", for reports of which we are mainly indebted to Albert A. du Petit-Thouars. Specially valuable for geographic and distributional records were the voyages (1852-54) of the "Herald", noted by Edward Forbes.

¶ The next important marine expedition was that of the "Novara" in 1865, associated with the name of the Austrian commander, B. von Wullerstorf-Urbair. In 1880-83 the Expeditions scientifiques du Travailleur et du Talisman furnished mainly marine records.

¶ In 1881 A. C. L. G. Günther edited the account given by various naturalists of the ~~vertebrate~~ zoological collections made by H. M. S. "Alert" in extreme South American waters and on coastal territory

In the year 1873 the voyage of the "Curaçoa", under the scientific care of Julius L. Brenchley, discovered many new zoological species. Although not published until 1884 the Report on the Zoology of H.M.S. "Alert", 1881-82, was issued by British Museum; not, of course to be confused with the Voyage of the "Alert" and "Discovery" to the Polar Sea in 1875-76, when H.W.Feilden described the mammals and birds and A. Günther the fishes.

¶ The next most important scientific expedition was the famous voyage (1881) of the "Challenger" under C. Wyville Thomson, the zoological reports of which fill many valuable volumes. Six years later (1887) Michael A. Healy directed the expedition of the "Corwin" and about the same time the "Vega" sailed round the northern world, the reports of whose scientific work are mostly furnished by N.A.E. von Nordenskiöld in several editions and languages. The year before (1886) F.H.H.Guillemard made many valuable observations and discoveries during the well-known voyage of the "Marchesa" and the reports of that expedition are among the fundamental treatises of systematic zoology. In

1888 Alphonse Edwards described the scientific expedition of the "Travailleur" and "Talisman", 1880-83. The student of zoological literature should by all means familiarize himself with the reports of these scientific expeditions that registered for the first time definite knowledge of much of the world's natural history.

Australasia and Oceania in general have always been favorite exploration areas for seafaring explorers - naturalists in particular. William Dampier (1652-1715) was among the best known of these adventurers and his voyages around the world included an expedition to New Holland in 1699.

At this point may be mentioned, among notable voyages, the several visits of the naturalist George Barrington to New South Wales and his account of them, published in 1795-1802.

Another Australasian traveler has received mention elsewhere in this volume - George Bennett (1804-1893) whose travels and reports of natural history explorations included Batavia and other far eastern countries. Most of his zoological works are listed in this Catalogue.

A combined history of voyages interesting to naturalists is the first edition, in four volumes, of John Hawkesworth's Account (1773) of the Expeditions of Captain Byron (1764-66); Wallis (1766-68);; Carteret (1766-69), and Cook (1768-71); ~~in the "Dolphin", "Swallow" and "Endeavour"~~

More recently A.W.Alcock under the caption A Naturalist in the Indian Seas, 1904, reported on collections made in the Survey Ship "Investigator".

Wagner's Reisen in Algier, 1841, resulted in large collections of birds and mammals which he described, while H. Schlegel reported on the amphibians.

As elsewhere shown, the numerous expeditions and voyages despatched by the Federal Government of the United States to all parts of the world (including the American continents) as well as the explorations parties sent out by the many Departments, Bureaux and Surveys, both of the central government and of the various states, have furnished hundreds of reports on vertebrate zoology. The present Index and the annotated Catalogue have listed these, mostly be found under the caption United States. In some instances these valuable contributions to natural history have been published separately, (in which case such) "author's editions" are also entered under the name of the writer.

The birds and mammals of Alaska collected by the McIlhenny expedition to Point Barrow in 1900 are fully described by Witmer Stone.

Among the more recent expeditions is that of the Steam Yacht "Scotia" during 1902-04, under the auspices of the Scottish Oceanographical Society. See "Scotia" in this Catalogue.

George Bennett (1804-1893) was an intrepid and instructed explorer-naturalist who is 1834 published an account of his Wanderings in New South Wales, Batavia, etc., in two illustrated volumes as part of his journeys around the world. In 1860 he issued from London an amended history of his Gatherings throughout Australasia, in which he describes many vertebrates.

An important exploration of Central Australia is the Horn Scientific Expedition, whose reports were edited in 1896 by Baldwin Spencer, the vertebrate zoology described by specialists.

Among the Explorations best known to systematic zoologists is John Whitehead's Expedition to North Borneo (1893) productive of many species new to science.

One of the most valuable reviews of the fauna of New Guinea is found in C.E.A.Wichmann's Nova Guinea, whose unfinished(?) publication (in French and Dutch) began in 1906.

One of the most successful voyages to the Antarctic regions from the viewpoint of vertebrate zoology was that of the "Southern Cross", ~~the report of which is given under Br. Mus. (Nat. Hist.) 1902.~~ In 1910 the "Terra Nova" made a somewhat similar voyage under the same commander, Capt. R.F.Scott. See Br. Mus. Cat. (Nat. Hist.).

Trevor-Battye's Ice-bound in Kolguev, 1895, furnishes "a chapter in the [natural history] exploration of Arctic Europe" well worth reading.

Although comparatively little space was given to vertebrate zoology in the early volumes of F. Nansen's Norwegian North Polar Expedition, 1893-96, yet R. Collett's and F. Nansen's brief Account of the Birds, must be mentioned.

More productive of literary effort are the reports on Die Zweite Deutsche Nordpolarfahrt .. in 1869 und 1870, edited by G. Hartlaub and M. Lindeman, when the anthropology, mammology, ichthyology, and ornithology of the expedition were fully described.

A more recent North Polar Expedition for scientific purposes is the Austrian Internationale Polarforschung, 1882-83, when the collection of vertebrates was described in a three-volume report.

Die Preussiche Expedition nach Ost-Asien, whose Zoologischer Theil was edited by E. von Martens in 1867-76, is also to be borne in mind.

Although comparatively little space was given to vertebrate zoology in the early volumes of P. Hansen's Norwegian North Polar Expedition, 1893-96, yet R. Collett's and F. Nansen's brief account of the Birds, must be mentioned.

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A more recent North Polar Expedition for scientific purposes was the Austrian Internationale Polarforschung, 1882-83, when the collection of vertebrates was described in a three-volume report.

Die Fresnelsche Expedition nach Ost-Asien, whose Zoological Theil was edited by E. von Martens in 1867-76, is also to be borne in mind.

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~~A more modern example is found in~~ The Narrative of the U.S.Exploring Expedition around the World under Capt. Charles Wilkes, 1838-1842, is of considerable importance in scientific literature. Chas.Pickering, J.P.Couthony, Jas.D.Dana, Titian R. Peale, and Horatio Hale gave accounts of their special activities in the Reports of the Scientific Results. The first edition (now extremely rare) of this government expedition was published in 1844; a new edition, New York, 1856, was printed in 5 volumes, with additional text and plates.

One of the outstanding examples of worthy contributions of travelers to science is E. Diffenbach's Travels in New Zealand, 2 vols., 1843, in which the mammalia, reptiles, and amphibia are described by J.E.Gray, the birds by G.R.Gray and the fishes by J. Richardson.

One of the best known Asiatic scientific expeditions was that of the Second Yarkand Mission, 1878-91, the collections of which were examined by specialists; Blanford, mammals; R.B.Sharpe, birds; F.Day, fishes, etc.

The majority of naturalist travelers to the New World seem to have visited South America during the past two centuries, so many indeed that there will be space for mentioning only a small proportion of them.

Don Felix d? (1746-1807) of noble birth was Azara, an engineer detailed by the Spanish Government to delimit the frontiers of Paraguay. He devoted much of his time to important observations of South American fauna part of which as reported in his Apuntamientos para Historia natural de los Quadrupedos, etc., 2 vols., Madrid, 1802. There is a French translation of this valuable work by Moreau de Saint-Mery, also in 2 vols., Paris (1801). Azara lived 20 years in South America, during which period he wrote further accounts of Central and South American fauna. This work was published after his death by C.A.Walckenaer; there is, also, a French translation by Sonini, 1809, in four 8vo. vols., and a folio atlas.

One of the best known of the voyages to the Far East were those of Pierre Sonnerat ~~(q.v.)~~ who visited (and described the natural history of) China, Papuasia, Ceylon, the Philippines, etc. between 1774 and 1781.

The collections of vertebrates made during Zichy's Dritte Asiatische Forschungreise, 1901, were described by well-known naturalists.

As several times indicated, our early knowledge of Russian fauna is largely due to the labors of Peter Pallas (1741-1811) whose journeys to various parts of the Empire have been described in several languages. These publications are to some extent listed in the present Catalogue, attention being especially called to his Reise durch verschiedene Provinzen des Russischen Reichs, etc. 1771-76, in three volumes and to his three-volume quarto entitled Zoographia Russo-Asiatica, 1811-42, completed long after his death. Peter Simon Pallas was born at Berlin in 1741, and in 1768, having acquired an international reputation as a naturalist, was invited by the Empress Catherine to St. Petersburg. He spent six years (1768-1774) in explorations of both European and Asiatic Russia, collecting an enormous array of scientific (mostly zoologic) specimens which formed the basis of many ethnic, geographic, floral and faunal treatises. He finally settled in the Crimea and died there in 1811.

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In 1799-1804 Alex. von Humboldt and Aimée Bonpland visited South America. The original German account of the expedition (in the Blacker Library) was translated and issued in 2 vols., 57 plates, under the title Recueil d'Observations de zoologie et d'anatomie comparée faites dans un voyage aux Tropiques, Paris,

1811-32. This record is not only remarkable for the faithful description of the animal life encountered during the voyage but is noted for the discovery of many new species.

The Compiler has drawn frequent attention to the many Voyages autour du Monde listed in the appended Catalogue as productive of much of our literature on vertebrates. Of these circumnavigations that of Count La Pérouse in 1785-88 is among the best known. It is also well to read Labillardière's three years' Voyage in search of La Pérouse, either in the original or in the English translation.

Prince Maxmilian of Wied-Neuwied wrote a Beiträge zur Naturgeschichte von Brasilien, in 4 octavo volumes, giving a classic account of his travels in that state and neighbouring countries during 1815-1821. The work was translated into French and published, like the German earlier edition, in Weimar. Among the many other naturalists who have visited Brazil and described its flora and fauna are J.E.Pohl, who gave his attention almost exclusively to botany; J.C.Mikan (1769-1844) author of Delectus florae et faunae Brasiliensis, 1820-1825; Johann Natterer, who wrote Zur ornithologie (and zur Säugethiere) Brasiliens, 1817-35, as the result of Reisen in that country, while J.B.Spix and Ch.F.P. Martius, under the patronage of King Max Joseph of Bavaria, visited Brazil and spent three years there, recording their floral and faunal discoveries under several titles, that of Martius being (Eine) Reise in Brasilien, 3 Tle., München, 1823-31. Spix (1781-1826) was born in Hochstaedt, and died in Munich; he studied first theology and afterwards medicine.

Martius, born in Erlangen, son of a chemist, was ennobled for his scientific services and died also in Munich. Spix wrote a series of monographs describing many species new to science in the whole animal kingdom. The titles of this series are uniform, e.g. Serpentes brasil, sp. novae, 1 vol., 26 col. pl. They are all listed in the accompanying Catalogue.

In 1820-21 Prince Max of Wied-Neuwied (1782-1867) visited Brazil and in 1832-34 North America, when he made a study of their flora and fauna. See the annotated titles in this Catalogue.

Accounts of many hitherto undescribed Brazilian fauna are given by Max Perty (the invertebratae in Delectus animal articul., 1830-31, 40 col. pl.) and by Agassiz, who specially studied the fishes (Selecta genera et species piscium, Monachii, 1829-31, fol., 100 pl.).

Johan R. Rengger (1795-1832), who was born and died in Aarau, spent eight years in South America and has given us a noteworthy account of the mammals of Paraguay (Naturgesch. der Säugethiere von Paraguay, 8vo, 1830, Basel).

One should not forget that among the earliest travels of Alfred R. Wallace was his exploration of the River Amazons, a description of whose natural history he published in 1853.

During 1826-33 Alcide Dessalines d'Orbigny (1802-1857) the well-known professor of Paleontology at the Jardin des Plantes, visited South America and wrote an account of his travels and discoveries that is a classic of zoologic literature (Voyage dans l'Amerique Meridionale, etc.) This large quarto was published in 90 parts illustrated by means of 415 plates. It usually appeass bound in 7 volumes text and 2 volumes in atlas form. D'Orbigny's contributions to the literature of the British Museum collections (shells, molluscs, etc) are even better known to students.

From 1854 to 1885 appeared numerous original monographs in German, Spanish, French and English, describing the zoology of travels to various countries in South America by the famous naturalist C.H.C.Burmeister, especially to Argentina and Brazil. In passing, one may also call attention to Charles Whymper's Travels amongst the Great Andes, 1892.

Eduard Friedrich Poeppig (1798-1868) wrote a picturesque account of his travels in the Americas that began with such high spots as Philadelphia and Cuba and ended in Peru, Chili and the Amazon Rivers. In it (Reise in Chile, Peru, etc., 1827-32, 2 vols., and atlas of 16 plates, fol., Leipzig, 1835-36), he gives a brief review of the fauna.

~~In 1822, W.E.Cormack explored Newfoundland and wrote an interesting account of its flora and fauna. See his Narrative, edited by Brunton, 1928.~~

Of much value is the scientific description of Chilean natural history afforded by the writings of the French author Claude Gay (1800-1873). The best of his works, of which Gay acted largely as editor, was published by the Government of Chile. It is the monumental Historia fisica y politica de Chile, etc., in 28 vols., text and 2 vols. atlas. Of the eight volumes devoted to zoology, the mammalia are treated by Gay and the aves by O. Des Murs. The evertebrata, botanica and other subjects are voluminously considered by numerous collaborators.

A useful treatise on the zoology of Peru is J.J. von Tschudi's Untersuchungen ueber die Fauna Peruana, etc., 1844-47, 4to, St. Gallen, the result of a five years' residence in South America.

Count Francis de Castelnau (1812-1880) published in 1847, under French Government auspices, a most valuable report (Expéditions ... pendant les années 1843-47, 180 pl., 14 vols., Paris) on the zoology of portions of South America, the result mainly of expeditions from Rio Janeiro and Lima. Accounts of the zoology are furnished in ~~three~~ 3 quarto volumes.

In 1863 appeared the first edition of that much reprinted classic, Bates's The Naturalist on the River Amazons. It should be carefully read by every student of South American natural history.

Dr. Albert C. L. G. Günther edited

In various connections the Schwedische Südpolar-Expedition (1901-03) has had a reference, especially the names of A.J.E. Lönnberg (aves and pisces) and K.A.Anderson (the higher animals in general).

In 1909 was published E.H.Shackleton's Heart of the Antarctic in two volumes, giving an account of discoveries made during the voyage of the "Nimrod", 1907-09. J. Murray edited the Biology of the expedition which was not fully reported until the Reports of the Scientific Investigations were made (a second edition) in 1911.

The scientific expedition of the Belgian "La Belgica" to the South Pole in 1897-99 did not gather many vertebrates, except pinnipeds, cetaceae and marine fishes. The reports were published in 1901-13. In 1902-3 the Deutsche Süd-polar-Expedition reported its Bericht on the natural history of the "Gauss" voyage.

Robert Hermann Schonburgk was born at Freiburg near Rossbach in 1804. In 1831 he made a scientific survey of the Virgin Islands where he was established as a merchant. During 1831-35 he explored and reported upon (see his treatises on the subject) British Guiana on a commission from the Royal Geographical Society. In the latter country he discovered the magnificent Victoria regia lily during a trip up the Berbice River. He was knighted in 1844. In addition to his various scientific works on British Guiana he published a very useful History of Barbados and after holding several offices under the British government he died in 1865 at Schöneberg, near Berlin. He accompanied his brother Richard (who wrote Reisen in British-Guiana, 1840-44) on several exploratory expeditions.

Sir Robert Hermann Schomburgk was born at Freiburg near Roesbach in 1804. In 1831 he made a scientific survey of the Virgin Islands where he was established as a merchant. During 1831-35 he explored and reported upon (see his treatises on the subject) British Guiana on a commission from the Royal Geographical Society. In the latter colony he discovered the magnificent Victoria regia lily during a trip up the Berbice River. He was knighted in 1844. In addition to his various scientific works on British Guiana he published a very useful History of Barbados and after holding several offices under the British Government he died in 1865 at Schöneberg, near Berlin. He accompanied his brother Richard (who wrote Reisen in Britisch-Guiana, 1840-44) on several exploratory expeditions.

The Report of the Second Norwegian Arctic Expedition (1898-1902) in the "Fram" devoted but one small section (pp.15) to the vertebrate class, viz. Fishes By A.S.Jensen.

As previously mentioned, one of the best reviews of the fauna of ~~the~~ northern South America was written by Richard Schomburgk. His valuable Reisen in Britisch-Guiana in den Jahren 1840-44, Leipzig, 1847-48, has, in part, been translated into English (1922) by the Compiler's friend, Walter Roth, the Director of the British Guiana Museum.

Another valuable contribution to the literature of South American fauna is the Physikalische Beschreibung der argentinischen Republik, 5 vols., 1875-80, Buenos Aires, by Carl Hermann Burmeister (1807-1892), the accomplished naturalist and traveler. A French translation of this important work was made by E. Maupas and E. Daireaux, Paris, 1876-86.

A later report of value (already referred to) is Louis Agassiz's Scientific Results of a Journey in Brazil; the Thayer Expedition, 1870.

re of the most recent exploratory expeditions for natural history purposes is et to the Gran Chaco area (Argentine, Bolivia and Paraguay). A volume on the bird-life of that important section of South ica has been written (1930) by Prof. Alfred Laubmann of ünchen. Other volumes are in press.

¶ Not to be passed over lightly as a contribution to the faunal history of Central South America is Travels on the Amazon and Rio Negro, 1870, by Alfred R. Wallace.

An earlier but even more valuable addition to our knowledge of South American fauna are the reports of what is generally known as the U.S.Naval Astronomical Expedition to the Southern hemisphere ... 1849-52, under Lieut. J.M.Gilliss, 6 vols., published by the government at Washington, 4to, 1856. The vertebrata are treated (in Vol. II) by S.F.Baird (Mammals); J. Cassin (Birds) and C. Girard (Reptiles and Fishes).

The various reports of the famous Wilkes U.S.Exploring Expedition during 1838-42 have been fully discussed elsewhere in this Introduction. A photostat copy of the extremely rare Narrative of 1845 is shelved in the Blacker Library. See the appended Catalogue.

The well-known Historia fisica of Ramon de la Sagra (director of the Botanical Gardens in Havana) dealing, inter alia, with the fauna of Cuba, has been touched upon elsewhere in this Introduction. A French translation of this important work was published in 1840-58.

Another naturalist, Felipe Poey (1799-1891) wrote Memorias sobre la historia natural ... de Cuba, Habana, 1851-58.

There were several local histories (mostly repprts of travels) published in America before 1700 that contain a few allusions to the fauna but these, in an elementary treatuse like the present, may well be ignored.

The first local work of importance, i.e. listing any considerable fraction of faunal life of the United States, is John Lawson's Description and Natural History of North Carolina, that went through several editions between 1728-1860. Of considerable importance is John Kirk Townsend's (1809-1851) Narrative of a Journey across the Rocky Mountains, ~~etc., 4to.~~ Phila., 1839, in an appendix to which the quadrupeds and birds found in the territory of the Oregon are catalogued. There are also notes on the fauna of the Sandwich Islands, Chili, etc. A London edition, illustrated, in two (2) volumes, was issued with a title somewhat different in 1840. Both works are rare. ~~and important.~~

~~In 1849 appeared the first and only volume (pp. 12., pl. 4. Phila.) of an Ornithology of the United States - very rare.~~

¶ Of early examples of these expeditions one may mention here that in 1675 Frederick Martens described his Voyage au Spitzberg et au Groënland; in 1658 de Rochefort published his Voyage aux Antilles: the expedition of Boccone was undertaken in Sicily, 1674; Guillaume Bosmar made a Voyage aux Côtes de Guinée, in 1704; in 1707 Hans Sloane described his Voyage to the West Indies (1707) including Madeira, in which he describes the flora and fauna of these islands; we note, also, the travels of Scheuzer in Switzerland, 1708, in 2 vols., with extracts translated into Latin and French.

Reference has also been made to the valuable monographs of Gundlach on the vertebrate orders of Cuba, and published separately, 1872-1893, by the Sociedad española de historia natural, Madrid.

During 1796-98 Ledru and Sonnini visited and described the natural history of the Virgin Islands and Porto Rico.

Augusta Sallé (d.1896) described, in conjunction with E. Parzudaki, a collection of birds made by the former under the title Catalogue des Oiseaux du Mexique, etc. (Paris) 1862, a useful but rare pamphlet, ~~&c.~~

¶ The two Bartrams, John B. (1699-1777) and William (1739-1823) published interesting contributions to North American zoology. The former traveler furnished Observations ... on the Animals ... of Pensilvania (sic) etc., London, 1751. William Bartram gave us Travels through North and South Carolina, Florida, etc., Phila., 1791. The original manuscript of this work and the drawings of the plants and animals to illustrate it are among the tresured items in the library of the Botanical department of the British Museum.

Several references have been made to Mark Catesby's Natural History of Carolina, Florida, etc., folio, 2 vols., 1731-48, with an English (1771, Edwards) and a German annotated edition (1749, Seligmann). This treatise with its early colored plates should be "seen" by every student of American Zoology.

Benjamin S. Barton's Fragments of the Natural History of Pennsylvania, 1799, is also regarded as a basic contribution to the study of American zoology, ~~and~~ This rare folio was reprinted by the Willughby Society, 1883.

J.B.Labat's Nouveau Voyage aux isles de l'Amerique, 1722, is important owing to the natural history of the West Indies to be found in its ~~six~~ 6 small volumes.

Two early and important works on vertebrate zoology are to the credit of Richard Harlan (1796-1843):- Fauna Americana; being a description of the Mammiferous Animals inhabiting North America, etc., 4to., Phila., 1825,; and American Herpetology, Phila., 1827. The still more important Viviparous Quadrupeds of North America, by Audubon and Bachman, in 3 vols. text and 3 vols. atlas, 1846, followed by the edition of 1854, has been noted elsewhere in this work.

One should not overlook the chapters on American birds in M.J.Brisson's Ornithologia (1760) elsewhere noted. It is a splendid example of good work, with 261 plates, but unfortunately giving only mononomes of the fauna. Here, too, mention must be especially made of John R. Forster whose rare tractate, A Catalogue of the Animals of North America (1771) contains the first scientific mention of many new species.

A rather early effort to describe animal life in the New World is Godman's American Natural History. The third edition is dated 1836, Phila.

~~Then~~ Thomas Jefferson printed (1782-and 1787) his classic Notes on the State of Virginia, with a fair account of its flora and fauna.

Of the greatest interest to us are the accounts of Captain Cook's three voyages that with the observations of the two Forsters, William Ellis, Hunter, John White, Phillips and others furnish intimate descriptions of the flora and fauna of Oceania.

The literature and Central and South American zoology was enriched in 1888 by a very interesting book, Belt's A Naturalist in Nicaragua, London.

It would not be out of place for the student to read at this juncture Frank Chapman's Study of Panama Zone Wild life, My Tropical Air Castle, 1929.

Among other ~~of these~~ local travelogues is Hudson's fascinating Naturalist in La Plata.

Too much importance cannot be attached to Vieillot's Histoire naturelle des Oiseaux de l'Amerique Septentrionale, 1807, 2 vols., folio. Coues regards this and the author's other contributions to the subject of almost as much importance to American ornithology as Wilson's treatises.

Another reference should be made to the scattered but valuable contributions to American zoology of that versatile genius and original observer, Constantine Samuel Rafinesque-Schmaltz, 1783-1840, best known to American readers as Rafinesque who, born in Galata, Sicily, died in Philadelphia. He wrote, among other monographs, Ichthyologia ohioensis, etc., 8vo. Lexington, Ky., 1820, a very rare treatise reprinted, with a life and portrait of the author, by R.E.Call, Cleveland, Ohio, in 1899. He also published the Atlantic Journal and Friend of Knowledge that appeared in 8 numbers, 1832-33, complete sets of which are very rare.

The zoology of the expedition under W.H.Keating to the Canadian Lake of the Woods in 1823 is described in a valuable report by Thomas Say in 1825.

~ 1822 W. E. Cormack explored Newfoundland and wrote his Narrative, an interesting account of the flora and fauna, edited by Brunton and published in 1928.

East African zoology is well represented in the Zoologische Ergebnisse of an expedition by F.L.Stuhlmann undertaken during 1888-90, 2 vols., Berlin.

The mammals and birds of Somaliland are described by P.L. Sclater and others in F.L.James' The Unknown Horn of Africa, London, 1888.

A good account of west-central African natural history (including its vertebrate zoology) is given by L.S.Schultze in his Zoologische Ergebnisse, 1908-13, the result of travels in 1903-05.

In 1913 C.A.Alluaud described the fishes of Lake Victoria Nyanza collected during an expedition to East Africa.

Another valuable contribution to our knowledge of East African vertebrates resulted from the Swedish Zoological Expedition to Kilimandjaro in 1905-06, 3 volumes, 1910. See Sjöstedt, B.Y., in the present Catalogue.

Adolf Friederich, Duke of Mecklenburg, headed an expedition into Central Africa in 1907-08 and his report ~~(q.v.)~~ furnishes a valuable account (1910-14) of the flora and fauna of that area.

Students of the natural history of Siam and French Indo-China should read A.L.Mouhot's Travels in those countries during 1858-60, two illustrated volumes, London. A.Günther describes in it many ~~collected~~ new species of mammals, reptiles and fresh-water fishes. ¶ As part of (its reports of its Decades Zoologiques of its) Mission Scientifique etc Indo-Chine, a ~~atic~~ account of its vertebrates ~~vertebrates~~ is published, ~~1902-1906~~, 1905-07.

Another report on Chinese vertebrates (some new species) is found in A.E.Pratt's To the Snows of Tibet through China, 1892.

A good account of the mammals and birds of Manchuria is found in P.L.von Schrenck's Reisen in Amur-Lande in 1854-56 that appeared in St. Petersburg during 1848-1900.

For several years past the Payne-Whitney Expedition and several other less important voyages of American vessels have been made to the South Seas. The former has carried on a most excellent and extensive collection and exploring work under the direction of Mr. Rollo Beck and his assistants, supervised by the American Museum of Natural History, New York. Dr. Cushman Murphy of that institution has in charge the ~~examination of~~ specimens collected during the voyage of "La France" and other vessels in the employ of the expedition and these appear mostly in the publications of the Museum.

The various Reports of the Princeton University Expeditions to Patagonia, 1896-99, include an account of the Mammals by J.A. Allen; Batrachiana and Reptiles by L. Stejneger; Fishes by C.H. Eigenmann.

The vertebrate zoology of northern South America is to some extent described in André's A Naturalist in the Guianas, 1904.

A charming ~~example of a traveler's~~ account of a naturalist's adventures is Hans Gadow's Through Southern Mexico, well illustrated, 1908.

A publication of considerable scientific importance ~~is~~ are the Fasciculi Malayenses, an account of material, including vertebrates, collected by T.N.Annandale and H.C.Robinson during an expedition to Perak and the Siamese Malay States in 1901-02.

The vertebrate zoology of North China is in part described by A. de C. Sowerby in Through Shên-kan (1912).

A noted traveler-naturalist was A.L.Adams, accounts of whose interesting wanderings in India, Egypt and Canada (1867-73) are separately recorded and shelved in the Blacker Library.

A readable story of South American travels is Ball's Notes of a Naturalist, published in 1887.

In 1867-69 Dall and Bannister published a locally important List of the Birds of Alaska. ~~etc.~~

The list of expeditions to and travels in Australasia is (as noted) a long one.

In 1849 Charles Sturt published an account of the natural history of Central and South Australia as a result of explorations made 1844-46.

Among the more recent contributions one notices Saville-Kent's Naturalist in Australia, and Semon's In the Australian Bush.

Wood. Rolfpath two 24-39

VII

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CHAPTER VI. — 12pt caps, #d

Forerunners, Contemporaries, Followers and Successors of Linnaeus. A Short account of Linnean Literature.

unal classifications and Nomenclature.

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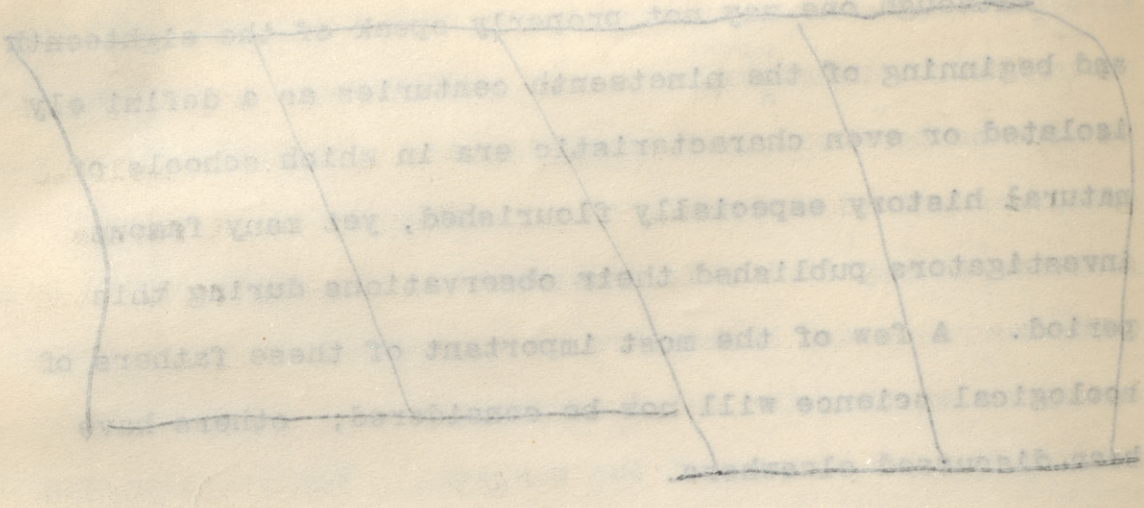
y — Linnaeus — Sherborn — Peter Artedi — Dumeril —
sselquist — P. Forskål — P. Kalm — D. Solander —
C. Fabricius — C. P. Thunberg — Erxleben — Rumphius —
T. Klein — M. J. Brisson — Rafinesque — Möhring —
. Turton — T. E. Bowdich — J. R. Forster — Swainson —
L. L. de Buffon — L. Daubenton — A. von Haller — Charles
onnet — Spallanzi — Fitzinger — J. T. Klein — J. M.
echstein — P. S. Pallas — Goethe — J. Fleming — L. Oken —
B. Spix — K. G. Carus — Max Weber — Louis Agassiz —
eo. Shaw — Vigors — Baird — Nelson — Richmond —
errian — Gill — Allen — Coues — Ridgway.

¶ The literature of faunal classifications, mostly controversial, may be said to have begun with Pliny and Aristotle, and having been touched upon vaguely here and through succeeding centuries by more or less original investigators, finds its first universally recognised authority in the truly great Linnaeus. It is needless to say that this Introduction has little to do with these currents and backwaters of zoological history; it is enough to mention the chief monographs (and their writers) that make up the literature of the subject. The Compiler has already mentioned most of the proponents of this, that or the other system and it remains to be said that the wordy warfare that has gone on for two centuries, resulting ~~partly~~ chiefly in the long "synonymies" that head the text-book accounts of various species, has grown out of a partial instead of a complete examination of the animal under review. ¶ By some investigators it is believed that until all the internal organs, the bony skeleton, the muscular apparatus and other ~~systems of animals~~ animal components receive the same careful examination for determining their specific place in classification that is now given to external characters, there will never be agreement among systematists as to nomenclature.

~~Although one may not properly speak of the eighteenth~~ and beginning of the nineteenth centuries as a definitely isolated or even characteristic era in which schools of natural history especially flourished, yet many famous investigators published their observations during this period. A few of the most important of these fathers of zoological science will ~~now be considered; others have been discussed elsewhere.~~

~~First of all one notices~~ Ray's systematics, ~~as a great~~ were a decided advance on the classification schemata of his predecessors, as they, in their turn, lag behind the biological system inaugurated by the illustrious Linnaeus, ~~of whom the Compiler has several times spoken.~~

Carl Linnaeus (or Linné) was born in 1707 of educated but poor parents, his father, vicar of ~~Stenbrohult~~ Räshult, being a good botanist. A student at the Universities of Lund and Uppsala he had a hard struggle to secure a bare existence and



was often in dire want. Before graduation, however, such was his enthusiasm for science, that he was allowed ~~himself~~ to give lectures in the University. That he might further advance in scientific knowledge he took up his residence in Holland where he studied medicine, ~~soon~~ took his doctor's degree and then moved to Leiden. There he was assisted in publishing his epoch-making Systema naturae which brought him immediate credit and fame. After travelling in Northern Europe for three years, during which time he published many treatises, he returned to Sweden where he made a bare livelihood by the practice of medicine. In 1741 he was made professor of botany at Uppsala and soon became not only the foremost teacher in the University, but was recognized as a world-wide scientific leader, acknowledged and acclaimed everywhere. He was the recipient of many honors and was finally ennobled, taking the name of von Linné. His systematic treatises are, as everyone knows, the foundation on which modern biologic classification is built. Some of the very numerous Linnaean "epithetics", among them Pulteney's Memoirs of the Great Naturalist, 1805, are to be found in the Blacker and E.S.W.Libraries; and it may be added that a complete annotated bibliography of all

Linnaean literature is now in process of preparation by Mr. Soulsby, the talented Librarian of Zoology in the (Natural History Dept.) British Museum. For the advanced student of Linnaeus a most useful handbook is Charles Davies Sherborn's Index to the generic and trivial names of Animals in the 10th, and 12th, editions of the Systema Naturae, 1899.

This is not the place to discuss the competence nor the weaknesses of the Linnaean binomial classification of plants and animals; the Compiler simply repeats one objection to them, viz; that their merits are by no means uniform. The Linnaean zoological classes were not treated as successfully as the botanic system, probably because the writer knew more about flora than he did about fauna.

The pupils of Linnaeus, some of which were foreigners attracted by the fame and enthusiasm of the great teacher, traveled abroad and made collections and observations independent of their instructor.

Among them mention may be made of those earlier observers who added anything worth while to the literature of zoology.

Peter Artedi, born in North Sweden, ~~a~~ more of a fellow worker than pupil, ~~and~~ joined with the young Linnaeus at Uppsala to study natural science, the one preferring botany, the other chosing zoology, especially ichthyology. While Artedi was preparing his Ichthyologia with the aid of his friend Linnaeus he came to a tragic end; he fell into a canal and was drowned towards the end of 1735. In 1738 his famous work on fishes was edited and published in Leiden by Linnaeus .

Of the French school of systematists and comparative anatomists one must not overlook André Dumeril who, in addition to numerous other contributions to natural history wrote a Zoologie analytique, ou méthode naturelle de classification des Animaux, 1806, and a Mémoire d'Anatomie comparée, 1807.

F. Hasselquist, an actual pupil of Linnaeus, traveled in the East and died (1752) in Smyrna. He gives the natural history of the countries visited in his Voyages and Travels in the Levant, 1766. This work, popular in its day, has been several times translated. ~~P. Löfling, beloved of his professor, after many adventures by land and sea, died (1757) in South America.~~ The student list also includes such well-known writers as Pehr Forskål (1732-1763,) whose Descriptiones Animalium is among the zoological fundamentals; Per Kalm (1716-1779); Damiel Solander (who held a position at the British Museum, and died in London in 1782); J.C.Fabricius (1745-1808) and Carl Peter Thunberg. Of these the last-named roamed farthest afield, collected the most material and published the largest number of monographs. His Fauna Americae

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meridionalis, Uppsala, 1823, in three parts, of which he acted as editor, is a very important contribution to American zoology.

J.C.P. Erxleben's Mammalia as part of his Systema Regni Animalis per classes, ordines, etc., 1777, must not be overlooked as an important document in the contest over nomenclature and systematics generally.

Because of its value as an early systematic study of faunal life in the Moluccas the Compiler draws attention to a rare folio, G.E.Rumphius' D'Amboinische raritekamer, etc. published in Amsterdam in 1705.

One writer and traveller of the eighteenth century, Jacob Theodore Klein (1685-1759) demands special mention. His careful treatises (q.v.) on floral and faunal subjects form an important contribution to the history of systematic biology.

One of the finest publications of this period is the Ornithologie of Mathurin J. Brisson (1723-1806) who, like the authors just mentioned, modified in many respects the classification of the Linnean Systema.

A student of Linnaeus and his classification was George Edwards, who, in his Catalogue of Birds, Beasts, Fishes, etc. 1776, and elsewhere discusses the systematic nomenclature of the listed fauna.

One of the numerous supporters of the Linnean method was the brilliant though erratic Rafinesque (1783-1840), that Sicilian-American to whom a more extended reference is elsewhere made. It will be remembered that there were, at this time, other systems, advocated by Barrere in 1745 (Ornithologiae Specimen Novem; Perpignan); Möhring in 1752 (Avium Genera; Zürich) and the better known Klein, who published his Historia avium Prodromus at Lubeck in 1750; also the noted English naturalist, William Turton (1762-1835), who not only translated the Systema Naturae but compiled a treatise on British Fauna (1807) arranged according to the Linnean System.

An American systematist of some note, T.E.Bowdich, made a rather early Analysis of the Natural Classification of Mammalia, Paris, 1821, dealing with both the Illiger and the Cuvier nomenclatures.

One of the early (and rare) Zoologia Americana is J.R. Forster's Descriptiones Animalium, 1771, reprinted (with a preface by P.L.Sclater) by the Willughby Society in 1882.

William Swainson (1789-1855) was an active British naturalist. During the first half of the nineteenth century he wrote many monographs on zoological subjects especially, on avian life in particular. Perhaps his most enduring contribution to vertebrate zoology was his Treatise on the geography and classification of Animals (1835), originally contributed to Lardner's Cabinet Cyclopaedia.

It was about this time that Johann J. Kaup (1803-1873) wrote his works on (anatomical) classification of animals, most of whose titles are listed in this Catalogue.

In 1850, A. White wrote a semi-popular history of the mammalia, in which stress was laid on classification and habits.

(whose classification of animals is important)

Of eighteenth-century zoologists in France Count Georges Louis Leclerc de Buffon, wealthy and well-born, was easily the most brilliant. He received a thorough education at home and, after making the grand tour, spent a year in London studying mathematics, physics and botany. In 1739 he was appointed keeper of the "King's Garden", now the Jardin des Plantes. Under his influence this Jardin du Roi was greatly extended and became the centre of biological research in France. Buffon was made a count, a member of the French Academy and became a universal social and scientific success. In the beginning of 1749 the first part of his famous Histoire naturelle was published and he continued to work on it for the remainder of his life. In this monumental task he was greatly assisted by the anatomist Louis Daubenton (1716-1800). The first edition was later followed by several supplementary volumes (Suites) and by many translations and editions of the treatise itself.

Several of these are represented in this Catalogue and mirror the reputation of Buffon as a natural scientist, brilliant writer and, in many departments of zoology, an original thinker. It will be noticed, however, in glancing at his contributions to literary biology that he seems unable completely to discuss the subject of mammals. This caption in his Histoire was dealt wit monographically by Daubenton and others, who added notes on their comparative anatomy.

Although that versatile prodigy, the Swiss-born Albrecht von Haller is best known as a physician, poet and physiologist, he made several contributions to pure zoology; among them a Historia naturalis ranarum, 1758, and a mass of observations on animals in his Bibliotheca anatomica, an annotated bibliography of all the literature in that scientific sphere to the date of its compilation. Osler said of him (Bibliotheca Osleriana p.117) that he "is the greatest bibliographer in our ranks. Next to the Index-Catalogue of the Surgeon-General's Library, his works have been most helpful in the preparation of this catalogue. To learning and judgment he added that indispensible quality in a bibliographer, accuracy."

Charles Bonnet (1720-1793) was, like Haller, born in Switzerland. Although he devoted himself almost entirely to insect biology, and is best known as the discoverer of parthogenesis (in the aphidae) he contributed somewhat to vertebrate zoologic literature; e.g. in his Contemplation de la Nature (1769; 2nd. ed.), 2 vols., and in his Oeuvres d'histoire naturelle, etc. (1779-81), 8 vols., 4to., published in Neuchatel.

Closely related to Bonnet but differing from him in some important respects was the Abbot, Lazzaro Spallanzi (1729-1799), born at Reggio. The Swiss naturalist translated the Italian scientist's Opere into French while Spallanzani himself published one of his early works with the title :- Fisica animale ... colla giunta di due scritti sullo stesso argomento del celebre Sig. Bonnet. (1782). The Osler library has a full complement of the works of these two friends.

Several references have been made to the zoological works of the famous zoologist, M.J.Brisson (1723-1806), a rival of Linnaeus. The Compiler again draws the student's attention, at this juncture, to the two editions, 1756 and 1762, of his Regnum animale, published in parallel Latin and French columns, as among the fundamental books of reference.

Of later contributions to faunal classification there must be borne in mind L.J.Fitzinger's essays on the subject, among them his Neue Classification der Reptilien, Wien, 1826; Naturgeschichte der drei Reiche, 1862-4, in 8 vols; and an unfinished Conspectus geographicus of which the Systema Reptilium appeared in 1843 as the first fascicle.

One may properly refer here to that faunal systematist, Jacob T. Klein (1685-1759), whose numerous works on all the major faunal groups are represented on the shelves of the McGill libraries. One of the best of these is his criticism (1743) of the arrangement by Linnaeus of his quadrupeds and amphibia in the Systema Naturae.

In 1795-7 J.M.Bechstein published the first edition of his treatise on caged-animals - including birds, mammals, fishes and amphibia. Not only have there been several editions of this well-known work but it served as a source of supply for numerous popular books on pet animals during several subsequent generations.

In 1731-8 E. Albin brought out A Natural History of Birds, in ~~three~~ 3 folio volumes, London, illustrated, and in 1737 published a book on English Song Birds, which is now very rare, there being no copy in the British Museum library.

Among well-known writers on comparative biology, was Peter Simon Pallas (1741-1811). Although born in Berlin and educated as a physician in Germany, most of his scientific work was done in Holland and Russia, in the latter country under the patronage of Catherine II. His contributions to biological literature deal in most part with zoology - especially with mammology. His Spicilegia zoologica, a series of monographs,

describes a number of new species. An account of his Russian travels, as well as several other titles by this important zoologist, are recorded in this Catalogue.

The Compiler has not the space required to do justice to a sketch of the life, activities, and enduring influence exerted on scientific thought by that intellectual giant Johann Wolfgang Goethe (1749-1832). It would absorb several pages to evaluate properly his many contributions to biology. Born at Frankfurt-am-Main in 1749 of wealthy bourgeois parents, he first practised law, and then became actively engaged in the political and literary life of the principality of Weimar. After a two years' residence in Italy he retired to devote the remainder of his long life to poetry and science. Of the numerous titles (and the many editions and translations of them) perhaps the best selection of his biological writings is the two-volume edition of Schriften zur Naturwissenschaft (1905-07) with notes by Max Morris. These are excerpts from the 14 vols. of the celebrated Weimar publication, mostly on natural science.

In 1822 the Rev. Dr. John Fleming wrote a Philosophy of Zoology, giving his views on the classification, structure, etc., of Animals that had considerable merit. He it was who subsequently (1828) published a fair History of British Animals in one large 8vo. volume.

describes a number of new species. An account of his Eurasian travels, as well as several other titles by this important zoologist, are recorded in this Catalogue.

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A South German philosopher who devoted himself to natural history, whose fame spread throughout continental Europe, was Lorenz Oken or Ockenfuss (1779-1851) who after graduation as a doctor of medicine taught in several home universities. Finally (in 1832) he settled in Zürich for the remainder of his life where he carried on his chosen work. Oken is the best known by the natural history periodical, Isis, which he published for many years. The articles in that magazine represent all phases of contemporary opinion; in its columns problems were presented and prizes offered for their solution. Since its discontinuation the title "Isis" has been given to several other periodicals, showing the sincere flattery of this form of imitation. Complete sets of this storehouse of information are becoming very rare; it was only after years of search that the Compiler was able to complete the files in the Blacker Library.

In the same collection are Oken's Allgemeine Naturgeschichte für all Stände, 1833-43, with an atlas of 158 col.pl. and his Lehrbuch der Naturphilosophie, ~~the Editions of~~ 1843. The coloured plates

former is a compilation of high order, the latter, by some regarded as the author's best work, reflects his peculiar notions about the Universe, its government, the sourse of animal life and so forth.

Every student of the history of systematic zoology should consult J.B.Spix's Geschichte aller Systeme in der Zoologie, 1811, a scholarly account of the science since the days of Aristotle.

Mention may here be made of Karl Gustav Carus (1789-1869), born in Saxony, court physician and (earlier in life) professor of comparative anatomy at Leipzig. In 1861 he summarized his rather eccentric notions about the relations of species to one another in his Natur und Idee. The whole animal system is arranged in circles, with protozoa at the periphery and homo sapiens in the centre - the Circular System.

A noteworthy work is Max Weber's Die Säugetiere, 1904, a monograph on the anatomy and classification of mammals recent and fossil.

An illuminating contribution to the science of classification is found in Louis Agassiz's (1854) Sketch of the Natural Provinces of the Animal World.

Of the army of systematists who compiled or wrote original schemes of nomenclature must be mentioned René P. Lesson (1794-1849) whose numerous contributions to the literature of vertebrate zoology are well-known. The Manuels, both of Mammalogie (1827) and of Ornithologie (1828) are among the earliest of his writings, while his various Tableaux furnish his ideas of faunal classification. Most of Lesson's titles are listed in the Catalogue.

A systematic treatise of considerable importance is the voluminous treatise (14 vols. with many illust.) by George Shaw, London, 1800-26.

To systematics based on special anatomy is the work of J.B.Spix, Cephalogenesis, sive capitis ossei structura, etc. 1815, by which classes, families etc., are to be determined by the conformation of head structure.

¶ In ~~many~~ Some systematic classifications all faunal forms are supposed to be grouped or to revolve about Homo sapiens as the central figure. Beginning with the Historia Naturae (1635) of Nierenberg, Fischer de Waldheim in his Tableaux Synoptiques de Zoognosie (1806) was followed by William S. Macleay (1792-1865) who further elaborated his concepts of the So-Called Quinary classification.

It was Vigors, however, that was most influential in pressing Quinary graphs on the scientific world, a task in which he was greatly assisted by Swainson. Both these writers contributed, between 1823 and 1835, many papers on the subject to the Transactions of the Linnean Society and to the Zoological Journal.

As stated by Swainson in his Geography and Classification of Animals (1835), this so-called "circular-grouping" held sway among systematists for a number of years.

While on this subject attention must be drawn to the fundamental and enduring work on neotropical classification and nomenclature carried on for nearly a century by American systematists - most of it contributed to U.S.Government Publications. Although titles in serials have been - as stated - necessarily ignored in this Introduction, the Blacker and other libraries of McGill University have on their shelves a goodly array of these indispensable publications that record the labors of Baird, Merriam, Nelson, Richmond, Gill, Allen, Coues, Henry, Ridgway, and a hundred other faithful workers - living and dead - who have left their mark on the history of zoology.

~~The next meritorious contribution to avian literature was the well known General Synopsis of Birds (1781-1802) by John Latham.~~

CHAPTER VII. 12pt caps Hd

e Fundamental Titles in the Literature of Modern Vertebrate Zoology. — Hand-Colored Atlases and their Makers. Animal Painters and Illustrators.

minck — Schlegel — Catesby — Albin — Geo. Edwards —
Sparman — Bree — Fritsch — William Hayes —
Swainson — Jacquin — Susemihl — Sven Nilsson —
Levaillant — Audebert — Vieillot — Prince Maximilian
ied [hyphen] Nieuwied — A. Desmarest — Audubon — Manetti —
Rüppell — J. A. and J. F. Naumann — John Gould —
aser — Sir W. Jardine — C. W. Hahn — Des Murs —
wley — Swainson — Lesson — Kittlitz — Reichenbach —
O. E. Perrier — Cassin — D. G. Elliot — J. E. Gray —
zar — Dresser — Olphe [hyphen] Galliard — Joseph Wolf —
eulemans. — George Moore. — Marshall Bros. —

Lichtenstein — William Lewin — Wolf and Meyer — Montagu —
Graves — Selby — John Hunt — Jenyns — H.L. Meijer —
Gyton — Macgillivray — Yarrell — F.O. Morris —
. Seebohm — Jardine — Booth — J. Rennie — Lord
ford — Shaw and Stevens — Dumeril — Gravenhorst —
Tiger — Hardwicke — Ranzani — Latreille — Wagler —
d'Orbigny — Millais — St George Mivart — Gaetke —
up — Prince C.L. Bonaparte — Giebel — Droesseart —
O. Waterhouse — C.D. Sherborn — Thos. Brown —
e Robert Gray —
chardson and Swainson — John White — F.A.A. Meyer —
~~oger Shaw — P.P. King — Geo Bennett — Gregory Mathews —~~
~~Alm Gould — Sharpe — A.J. Campbell — Wiggleswor th —~~
alvadori — Casey Wood — Alex. Wetmore — F.W. Hutton —
R.B. Oliver —

¶ The modern literature of European fauna deals ~~mainly~~ largely with continental forms. So far as birds are comcerned - and they occupy much of the limited space devoted to animal life in this Introduction - mention has already been made of Temminck's Manuel d'ornithologie. It first appeared as a single book in 1815, but was expanded into several volumes, and for ~~several decades~~ fifty years was the best known work on European ornithology. One of the author's colleagues, Hermann Schlegel, brought out (1844) in German, Latin and French a Kritische Uebersicht der Europäischen Vogel which treated to the date of publication and in masterly fashion the whole subject of European fauna. ¶ ~~Dating from~~ The first six or seven decades of the nineteenth century ~~have been~~ formed the period, par excellence, of splendor in hand-colored illustration. Neither before nor since have s - especially birds - been so splendidly and effectually depicted. ~~Still~~ There were, it is true, a few forerunners of these really ificent atlases - ~~many~~ most of them folios and quartos - ~~and~~

~~About this time atlases of colored plates figuring birds began to appear.~~ Among the earliest ~~first of these~~, being ~~were~~ two large folios (1731-1743) containing fine ~~textual~~ illustrations of Mark Catesby's well-known Natural History of Carolina, destined for several foreign translations and reproductions. This work was followed in 1738-40 by Eleazer Albin's colored figures illustrating his Natural History of Birds, and, best of all, by George Edwards' Gleanings of Natural History in four quarto volumes.

As early as 1786-89, A. Sparman's Museum Carlsonianum (q.v.) with 100 colored plates was published. Later (1832-37) appeared the magnificent Gould's Birds of Europe, in ~~five~~ 5 folio volumes. In 1849 was published Degland's Ornithologie Européene, in ~~two~~ 2 volumes, whose errors were supposed to be corrected by Gerbe in a second edition (1867). Bree's excellent Birds of Europe not observed in the British Isles, 4 vols., 1858-63, in 1875 reached an improved edition of 5 volumes, while Anton Fritsch, in 1870-71 published his Naturgeschichte der Vögel Europas with a well made folio Atlas.

Of the earlier examples of zoological atlases with fine, colored plates, one must remember the works of William Hayes, especially his Natural History of British Birds (1775), 40 colored plates, and his famous Osterley Park Portraits (1794) with 101 hand-colored plates.

A fine early atlas of hand-colored plates, 3 volumes, with text, is W. Swainson's Zoological Illurations, 1820-23.

Jacquin's Beyträge zur Geschichte der Vögel, 1784, although a small folio, has 19 excellent colored plates.

Another noteworthy atlas is J.C.Susemihl's Abbildungen der Vögel Europas, 1839-51, a quarto with 106 fine, colored plates.

Influenced to an extent by the previous activities of Linnaeus, Sven Nilsson (1787-1883) began his literary labors by publishing, in 1817-21, his Ornithologia Svecica, followed soon after by several treatises and fine atlases on Scandinavian fauna in general, most of which had subsequent editions. Consult the present annotated Catalogue. An ~~hand colored~~ Afbeeldingen Netherlands Zoology, 316 well-executed ~~plates~~ hand-colored tes, of which 133 depicted birds, was issued in 1838 by Nicolaas lijn.

~~Returning to the more general literature of avian zoology, reference must be made to what may be called the era of hand-colored plates.~~ Lithographical Reproductions of colored drawings have never been ~~equalled before or since~~ surpassed by the atlases of ~~First is the atlas of~~ François Levaillant (1753-1824), ~~already~~ several times mentioned in these pages. His earliest large work was a magnificent folio - with many colored plates - the Histoire naturelle ..... d'Oiseaux de l'Amerique, etc. (1801); the next three were the famous volumes on Parrots, not completed until after the author's death, followed by two monographs on other avian groups. It seems a pity that he was unable during his lifetime to complete, even with the aid of his son and of Temminck, his admirable Oiseaux d'Afrique, the sixth and last volume of which was published in 1808. The McGill Libraries have

almost complete sets of F. Levaillant's works, including the rare English rendering (London, 1790) of the Voyage dans l'interieur d'Afrique, Paris, 1790.

A contemporary and similar series of works to those of Levaillant were begun by Audebert and Vieillot. In 1802 appeared their Oiseaux dorés, two folio volumes, remarkable plates whose fine hand-coloration is heightened (though from the systematic point of view not improved) by gilding. This resplendant collection was followed in 1825 by a Galerie des Oiseaux, also in two volumes with 301 fine hand-colored plates.

Vieillot issued in 1805 a work on the "beaux chanteurs" of the torrid zone, and in 1807 another treatise on the birds of North America.

A fine colored atlas (90 plates) of the fauna of Brazil accompanied Prince Maxmilian Wied-Nieuwied's Abbildungen zur Naturgeschichte Brasiliens, 1822-31.

Mention must be made also of A. Desmarest's (1784-1838) Histoire Naturelle des Tangaras (1805), as well as of the publication in 1808 of a rare and beautifully illustrated Histoire des Pigeons by C.J.Temminck (1770-1858), assisted and illustrated by Mme. Knip. In 1813-15 he published, alone, a 3 volume work on the same subject. These fine atlases were followed in 1815 (2nd ed. 1820-24) by his Manuel d'Ornithologie which was translated into Dutch in 1824.

~~This period and the following half-century saw the issue~~ Of the many folios and quartos illustrated by splendid and costly hand-colored plates, the ~~First on the list is~~ blue ribbon must be awarded to an americana, Audubon's famous elephant folio of 435 life-size studies of the Birds of America (1827-38). This magnificent atlas was followed by several folio and smaller sized editions, both of plates alone and of text under the title Ornithological Bibliography. All these ~~magnificent~~ editions, reprints and variants, are listed in this Catalogue and shelved in the libraries of McGill University. A sketch of Audubon's career and a further account of his literary activities will be found ~~in~~ in the chapter on ~~Unique~~ Unica.

In 1820 Temminck (1770-1858) and Laugier projected a supplement to D'Aubenton's Planches Enluminées (1771-86) with the title Nouveau Recueil, etc., (1838). One hundred and two parts in ~~five~~ 5 volumes illustrated by 500 plates were issued at irregular periods, the last in 1839. One of Temminck's disciples was J.C.Werner, whose splendid Atlas des Oiseaux d'Europe of 530 plates (1842-48) is elsewhere described.

An admirable Italian and Latin ornithological compilation by Xaverio Manetti (1723-1784) and others in ~~five~~ 5 volumes, fairly well illustrated in color, was published at Florence, 1767-76.

Vieillot completed in 1825 the text of the Galerie des Oiseaux, an ambitious effort to figure and describe every avian species. Oudart prepared the plates, and the work was continued until 299 colored illustrations had been published.

Although many brilliant colored atlases of birds(and fishes) will be mentioned and listed in this work it must not be forgotten that similar collections of pictures covering all the vertebrate orders were occasionally published, an example of which is the Atlas zu der Reise im nörd. Afrika, by E. Rüppell in 5 parts with over 100 fine colored plates.

Contributions to the long list of early hand-colored treatises on the avifauna are the remarkable volumes of the two Naumanns, beginning with Johann Andreas (1744-1826), whose Naturgeschichte der Land - und Wasser - Vögel des nördlichen Deutschlands, etc. (1789-1803) with drawings by Johann Friedrich (1780-1857) was followed by several similar titles, generally accompanied by atlases with hundreds of colored plates. These editions (the last one of 12 volumes, completed in 1905) really form the principal accounts we have of middle-European birds, and the Compiler advises all students to make themselves familiar with their pages.

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¶ In 1832 ~~or 1830~~ John Gould began the publication of his wonderful series of zoological monographs that for profusion of hand-colored illustrations have never been equalled. Beginning with A Century of Birds from the Himalaya Mountains he finally published through a series of years about ~~forty-five~~ 45 folio volumes (exhibiting 3000 colored plates) that comprise a marvellous array of treatises, whose full titles will be found in the present Catalogue. They constitute the most attractive literary treasures of the Blacker and E.S.W.Libraries, and include his famous Birds of Asia as well as the incomparable atlas-treatises on Humming Birds, Toucans, Trogons, etc.

Fraser's ambitious Zoologia typica, begun in 1841, was intended to include a general series of colored plates, and although the ~~seventy~~ 70 plates that did appear were extremely well executed the enterprise did not meet the support it deserved, and it was discontinued in 1849.

Better in execution are the colored pictures prepared by Selby and Jardine for Illustrations of Ornithology (1827-43) in four volumes with over 200 plates.

In 1834-41 appeared C.W.Hahn's Ornithologischer Atlas of birds of the world, unfinished after 137 colored plates had been issued.

John Wilson's Illustrations of Zoology (1828) produced 36 colored plates.

Des Murs planned a supplement to the Planches enluminées entitled Iconographie ornithologique, which, with 72 colored plates, was completed in four years (1845-49). Similar to it are the Esquisses ornithologiques of Du Bus, with 37 plates, followed by the more valuable Exotic ornithology of Sclater and Salvin with 100 plates picturing 104 species from Central and South America. About the same time appeared the periodical Ornithological Miscellany of

Rowley (1875-78), having as contributors the leading British ornithologists of the day. The hand-colored plates are unusually good, from drawings by that fine artist Keulemans.

Most of the atlases described above (costly and rare folios and quartos) were followed about this time by quite a few volumes on zoology of smaller size and, generally speaking, of minor importance. Among these were Swainson's excellent three (octavo) volumes of Zoological Illustrations with 182 colored plates (1820-21), succeeded by a second series, equally good, completed in 1833. The latter, of three more volumes, contained 136 plates.

About this time (1828) Lesson brought out in two duodecimo volumes his Manuel d'Ornithologie and in (1831) an octavo Traité d'Ornithologie, with an atlas of the same size containing 119 plates. A well executed Centurie Zoologique, with 80 colored plates, completed in 1831 and followed by Illustrations de Zoologie, 60 plates, were also due to the labors of this well-known and diligent naturalist.

In 1832-33 Kittlitz published his Kupfertalfeln zur Naturgeschichte der Vögel, with 36 plates.

A ~~Attention~~ has already been drawn to the elaborate works of Reichenbach, who in 1845 began publication of his remarkable series of illustrated quarto treatises which were issued during the following ten years and are generally referred to under the title Vollständigste Naturgeschichte der Vögel. On about 1000 plates - 900 colored - are crowded illustrations representing avian species, mostly reduced in size from other authors, Gould in particular. A.B.Meyer, in 1879, published a useful, indeed necessary, Index to these numerous pictures.

During 1902-06, J.O.E.Perrier published La Vie des Animaux illustrée in four volumes with numerous colored plates; mammals by A. Ménégaux and birds by J. Salmon.

In 1853-1855 Cassin brought out what is regarded by some as a supplement to Audubon's octavo edition, Illustrations of the Birds of California, etc., and in 1866-1869 D.G.Elliot published an important and well-illustrated sequel to Audubon's treatises entitled New and hitherto Unfigured Birds of North America.

After the lapse of nearly eighty years an accomplished ornithologist-painter, Rex Brasher, (following the example of Audubon) published an atlas (1930) of 12 volumes depicting all the birds of North America - a stupendous undertaking rivalling the work of Audubon in execution and much exceeding him in the number and variety of his pictures.

In 1830 John Edward Gray began publishing his atlas, Illustrations of Indian Zoology, without descriptive text.

During 1832 Lear issued his faithfully figured work on Parrots. Many of the original drawings used to illustrate this monograph are now in the Blacker Library.

~~Published his Naturgeschichte der Vögel Europas, with a well-made atlas folio~~. ¶ A notable work on European bird life is that of Dresser (and Sharpe) who began their well-known Birds of Europe in 1871, to be completed alone by the former in 1879 - a splendid 4to. quarto set of eight volumes, followed by a helpful supplement. The beautiful colored plates are reproduced from the drawings of Keulemans and Neale. Newton (Dictionary of Birds, p.42) remarks of this fine piece of work: "European ornithologists have been all but unanimously grateful to Mr. Dresser for the way in which he brought this enormous labor to q successful end." ¶ A popular work was Des Murs' Description des Oiseaux d'Europe, in 4 octavo volumes, with colored plates of birds and their eggs. Léon Olphe-Galliard issued in 41 fascicles his Contributions à la Faune ornithologique de l'Europe Occidentale, 1884-91, usually bound in 4 volumes, one of the most important systematic treatises ever written on the subject. Among several similar publications, J. Backhouse brought out (1890) a useful Handbook of European Birds. The E.S.W.Library has an interleaved and annotated copy prepared by the author for a second edition that never appeared.

The greatest of all animal painters, Joseph Wolf, began in 1855 the publication of his Zoological Sketches from subjects in the London Zoo. This wonderful exhibit of faunal portraiture has never been equalled ~~especially~~ in that desirable but rare combination - fidelity to nature and artistic conception. The Blacker Library has a small number of original drawings by Wolf that are regarded as among the finest of its "association" possessions.

Several large zoological atlases were the product of the pen and brush of George Moore (q.v.) who, among other works, depicted the collections in the Museum Leverianum (1792-96), and with F.P.Nodder issued 24 volumes of colored natural history plates with the title The Naturalist's Miscellany, London, 1790-1813.

These truly great examples of colored reproductions of animal subjects (most of them finished by hand) were followed at rather regular intervals for many years by smaller enterprises, some of them of importance. Another example is the Marshall Bros. Capitonidae or Scansorial Barbets, a monograph with 73 beautifully colored plates, London, 1870-71.

As the Compiler has elsewhere mentioned, both the Centurie Zoologique (1830) and the Illustrations de Zoologie (1832) of Lesson, the former with 80 and the latter with 60 colored plates, deserve a place with the best of the colored bird atlases.

A valuable Museum Curator who utilized his material for publishing drawings, catalogues and letter press of scientific value, was M.H.C.Lichtenstein of Berlin (1780-1857). See the ded Catalogue.

One of the treasures of the Blacker Library is William Lewin's Birds of Great Britain, with the 7 extra-illustrated volumes of hand-colored plates, London, 1789-94, elsewhere fully described.

Another fine atlas is that of Wolf and Meyer's Naturgeschichte der Vögel Deutschlands, 1805-21, with 176 colored plates.

Of Montagu's remarkable Ornithological Dictionary (various editions 1802-83) it may be repeated that it was the earliest and best of its kind. Graves published in three volumes and two editions (1811-21) a British Ornithology that does not find favour with Newton who prefers the contemporary treatise of the same title by Hunt, published at Norwich (3 vols., 1815-22) but never completed.

About this time (1825-33) appeared a fine series of 222 colored plates engraved by the author - Selby's Illustrations of British Ornithology, in two folios, accompanied by two similar volumes of text. This well-known work passed to a second edition, the first volume of letterpress being changed to bring the classification in conformity with the so-called Quinary theory that then (and for a long time afterwards) was quite fashionable.

Although criticized by some of his fellow ornithologists the three volumes of John Hunt's British Ornithology, 1815-22, deserves mention at this time.

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A fairly well-known octavo work - now quite rare - appeared in 1828, Fleming's History of British Animals, followed in 1835 by Jenyns' Manual of British Vertebrate Animals, a very useful handbook. Librarians and others will please note that Leonard Jenyns later underwent a change of name (but not of heart) to L. Blomefield. It was in 1843 that H.L.Meÿer completed his celebrated Coloured Illustrations of British Birds and their Eggs, in 4to. A second 8vo. edition, seven volumes, 1842-50, was followed by a reissue, 1852-57. Eyton, in 1836, published a supplement to Bewick's Birds (1821) under the heading History of the Rarer British Birds.

The year 1837 was marked in the annals of British vertebrate zoology. This was the inception of treatises on the bird life of Britain by Macgillivray and Yarrell. The eulogy pronounced upon the works of both these naturalists by Alfred Newton is, in the judgment of the Compiler, well deserved; "They still stand as the best that could be said on the subject in the middle decades of the nineteenth century." An entry of most of the editions of their principal

studies - both entitled A History of British Birds - will be found in this Catalogue. Saunders, it may be added, condensed and practically re-wrote (in one volume, 1889) Yarrell's three volumes to form a most valuable and useful Manual of British Birds.

Profiting (in quite a legitimate fashion) by the observations and writings of Macgillivray and Yarrell, ~~both~~ the Rev. F.O.Morris A Natural History of the Nests and Eggs of British Birds, 3 vols., 8vo., ~~First~~ 1st ed., 1853; a History of British Birds, 8 vols., numerous editions, and H. Seebohm a History of British Birds, etc., 4 vols., 1883, and several other and earlier editions. ~~published what for~~ The volumes were for many years ~~were~~ very popular; ~~and~~ they were well written and excellently illustrated works on the subjects of their title pages.

Although Professor Newton does not hesitate, in his usual frank manner, to state what he regards as the inferior status of the Morris and Seebohm volumes yet there are several authorities that do not agree with him. Certainly the works of both authors were employed as text-books by several generations of teachers and advanced students, to the entire satisfaction of all concerned,

and the colored plates that adorn the text have been approved and copies by many experts and informed illustrators to the present hour.

A unique literary and book-making performance is Jardine's Naturalist's Library (1830-45), forty 8vo. volumes. This semi-popular work, successfully picturing by means of hundreds of hand-colored portraits, the vertebrates of the world, is a wonderful little library of natural history, an encyclopedia of faunal monographs of which three editions, one a reprint, have appeared. The memoirs of celebrated naturalists, that form part of the Library, are well worth reading.

Another excellent treatise, with the misleading title, Rough Notes on Birds in the British Islands, is by Booth of Brighton, 1881-87. These works form two folios, with fine drawings by Keulemans.

~~A work known to every ornithologist is Lord Lilford's Coloured Figures of the Birds of the British Islands (1885-97) with 456 drawings chiefly by Keulemans and Thorburn - a delight to the artistic eye.~~

Here one may draw attention to a rather useful book, J. Rennie's Architecture of Birds, one of the early monographs on avian anatomy.

Every doctrine promulgated by the immortal White of Selborne is revered by this Compiler, and he firmly believes, with the great naturalist, that "every kingdom, every province should have its own monographer", but when it comes to the recognition of half-a-dozen monographers for every province he would like to draw somewhere a well-marked line. In no country (although Germany and the United States make a good second) in the regional world have "local faunas" been so widely exploited as in the British Isles. There seems to be a monograph on the vertebrates of every region, county, city and town of the United Kingdom, several times repeated. Some of these will be noticed; for the remainder the Catalogue must perform that duty.

The array of expensive colored atlases just described by no means exhausts the output of zoological literature of the same character during the period indicated; These were systematic manuals and other treatises published in considerable numbers, the colored plates being mostly subsidiary to and illustrative of the complete letter press. Of more recent examples one may (456) magnificent Coloured Figures of the Birds of the British Islands, by Lord Lilford (T.L.Powys) in seven volumes; the drawings by Keulemans and Thorburn.

¶ Returning for the moment to vertebrate zoological literature in general, among the more important handbooks and monographs are Shaw and Stevens' Zoology, in 14 volumes (1809-26); Dumeril's Zoologie analytique (1806); Gravenhorst's Vergleichende Uebersicht des linneischen Systeme (1807); Illiger's Prodromus Systematis Mammalium et Avium (1811), a useful handbook; Vieillot's Analyse d'une nouvelle Ornithologie (1816), now very rare, but reprinted by the Willughby Society; Temminck's Manuel d'Ornithologie (1820) in which he promulgated an Analyse of his own that criticized and really supplanted the classifications of Vieillot and Illiger in the minds of ornithologists generally.

Another fine example of faunal depiction is Illustrations of Indian Zoology, by T. Hardwicke and J.E.Gray, 2 vols., 1830-34. Still another is De Kay's Zoology of New York (1842-44) in which the birds are shown in 141 fine colored plates.

Ranzani in 1821 published his compilation Elementi di Zoologia in 8 volumes; in 1825 appeared Latreille's Familles Naturelles du Regne Animal, and in 1827 Wagler completed his Systema Avium, followed in 1830 by a Naturliches System der Amphibien, both works being more fanciful than useful to students.

For the serious student of American ornithology d'Orbigny's Synopsis Avium, based on his Voyage to America, must not be forgotten.

The Compiler has several times mentioned the association of so-called "sport" (game hunting) as a subject inseparable from other epithetics of zoologic literature. One of the best known, modern, illustrators of works on game animals - especially birds - is John G. Millais. Among many publications of merit are his Game Birds and Shooting-Sketches, 1892, admirably illustrated by 34 colored plates. More to the Compiler's liking are his British Surface-Feeding Ducks, 65 plates, 1902, and his Mammals of Great Britain and Ireland, 1904-06, in three finely illustrated volumes.

About the same time (1896) appeared a magnificent quarto, with 61 colored plates, St. George Mivart's Lorïdae, preceded by another admirable monograph, 45 plates, on the Canidae (1890).

Covering, after a fashion, the same ground as Gätke's famous Vogelwarte Helgoland, 1891, an English translation by Rosenstock, entitled Heligoland as an Ornithological Observatory, was published in 1895.

The ever-present, ever-changing subject of faunal classification received an impetus by the writings of Kaup, especially in his Allgemeine Zoologie (1829) and twenty years later in his Ueber Classification der Vögel.

In this connection one must mention the illustrious name of Prince Charles Lucien Bonaparte, whose famous and useful Conspectus Generum Avium (begun in 1850) was in 1865 provided with an indissable supplement by Finsch.

The professional naturalist ought also to be within reach of Giebel's Thesaurus Ornithologiae, published in 1872-77, another valuable work of reference. ¶ Here insert XXX

A well-known systematist, E.L.Trouessart (1842-1918), has
itten several annotated lists of mammals and birds, among them
s Catalogus mammalium, 1898-1905, and his Catalogue des Oiseaux
Europe, 1912. Other systematists have worked at the same
sk, among them C.D.Sherborn (q.v.) and C.O.Waterhouse. The
tter first published his Index Zoologicus in 1902, as part of
e indispensable Zoological Record.

~~Although there is a voluminous literature published about this time on a once much-agitated subject, it is not intended to discuss the merits or demerits of the Quinary or Circular System of Classification. The Compiler has referred briefly to this matter elsewhere.~~

The works of George Robert Gray mark an important era in zoological literature. For many years in charge of the ornithological collections in the British Museum he began by publishing his important List of the Genera of Birds in 1840, followed by a second edition in 1841. The E.S.W.Library has both of these editions, the latter one being Gray's own interleaved copy with MSS notes for subsequent treatises.

In 1844-49 appeared his Genera of Birds in three folio volumes, beautifully illustrated by Mitchell and Wolf, with 185 colored and 148 uncolored plates. It contains references to more than 2,400 generic names and forms an indispensable item in every research library on zoology.

The foregoing were privately printed, but in 1855 Gray brought out for the Museum his well-known Catalogue of the Genera and Subgenera of Birds, a small but useful manual based on his larger works.

Dr. Chas. Richmond, in a letter to Mr. W.L.Sclater, points out that the Carnegie Museum has appended to its library a copy of this 1855 Catalogue an additional title-page reading "A List of Genera and Subgenera of Birds", 1855 (Taylor and Francis) followed by a leaf of "Addenda" printed on both sides. Dr. Richmond thinks this is not a part of the British Museum publication but was added in a few instances by Gray to presentation copies. At any rate they are certainly exceedingly rare leaflets.

In 1869-71 Gray published for the Museum his Hand List of Genera and Species of Birds in three parts, making ~~three~~ 3 octavo volumes, thus adding more valuable tools to the armament of the research student.

The first zoological work published at the expense of the British Government, the Fauna Boreali-Americana (1829-37), now appeared, a magnificent and wonderfully useful series by Richardson and Swainson.

~~Mixed literature 1750 – 1850~~

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Chapter VIII — 12pt caps Hd

From Natural Philosophy to Modern Biology.

The Literature of Vertebrate Zoology.

1750 to 1850 A.D.

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es — T. Horsfield — Reinwardt — C. J. Temminck — Mauduyt —
nant — Schäffer — P. Brown — Hermann — Jaquin —
er Alpinus — Schwenkfeld — Salerne — D'Aubenton —
riffith — J. E. Gray — P. L. S. Müller — Tegetmeier. —
elin — F. M. Daudin — J. R. Forster — Thienemann. —
ew Smith — Andersson — Holub and Pelzeln — Shelley. —
pard — Reichenow — Von der Decken — Canon Tristram —
lebrune — A. Milne-Edwards [hyphen] — A. Grandidier —
smus Darwin — E. Geoffroy Saint-Hilaire — F. Cetti —
. Blumenbach — Lamarck — Baron Cuvier — T. Schwann. —
hard Owen — J. P. Müller.

The last half of the eighteenth and the first half of the nineteenth centuries witnessed the visits of a number of zoologists not only to India but to its neighbouring countries. Among these naturalists one may mention Sir Stamford Raffles (1781-1826) who not only wrote, in 1817, a two-volume History of Java (valuable to students of zoology) but contributed to Jardine's Illustrations of Ornithology! Here insert (++) XX

Stamford Raffles, son of a British sea-captain, was
n in Jamaica, July 5th, 1781. In 1795 he was appointed
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Dutch travelers sustained their reputation as active explorers by contributions to the natural history of their own East Indian possessions. Of these Caspar G.C.Reinwardt (1773-1854) was a prominent writer, although his reports were mostly botanical.

As a member of the Natuurkundige Commissie in Ost-Indie Salomen Mueller wrote (with H. Schlegel) a Zoology of the Dutch East Indies, folio, 1839-44, that is a reference classic. Working on the same task C.J.Temminck contributed Verhandling over de Natuurlijke Geschiedenis der Nederlandsche overzeesche besittingen, etc.

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Thomas Horsfield (1773-1859), born in Philadelphia, died in London, who was the author of many treatises on the fauna of the Far East - the Dutch East Indies in particular. Perhaps Perhaps one of his finest contributions to the literature of the subject was his Zoological researches in Java, 4to., London, 1824, with a large number of colored plates.

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In quick succession followed Shaw's Memoirs (1792) of the Museum Leverianum, Mauduyt's Ornithologie (1784) in the Encyclopédie Méthodique, a second edition of which was begun in 1790 by Bonnaterre, after whose tragic death during the French Revolution it was finally finished by Vieillot in 1823. A little later appeared the first (folio) edition of the monumental treatise of Naumann on the birds of Germany.

In the preface to his Dictionary of Birds, Newton briefly cites the names of many ornithologists and their works as belonging to this period, among them Thomas Pennant (1726-1798) (Genera of Birds); Schäffer (1718-1790) (Elementa ornithologica); Peter Brown (fl. 1776) (New Illustrations of Zoology); Hermann (1738-1800) (Tabulae Affinitatum Animalium); Jacquin (1766-1839) (Beytraege zur Geschichte der Voegel); Sparmann (1748-1820) (Museum Carlsonianum), and Hayes (cir. 1729-1799) (Portraits of Rare and Curious Birds). These titles, with their dates of publication, appear in the accompanying Catalogue of the McGill Libraries.

Early voyages to still more remote parts of the Old World and descriptions of their faunal and floral life are described by many Hardy explorers. Only a few of these can be mentioned here; the expedition to Palestine of Georg Breydenbach, who furnished the first drawing of the giraffe; of Johannes Leon Africanus, a Spanish Arabian (El Hassan el Wasan, died 1532), whose writings on African zoology have been "absorbed" by several other writers; of Prosper Alpinus (1553-1617), whose Historia naturalis, descriptive of animal life in Egypt, appeared in Leyden, 1735; and the many travels and reports of Pierre Belon, the celebrated naturalist whose works we have several times noted.

Quite early the Russian empire was visited, explored, and described (mostly by Germans) to some degree in the interests of scientific research. Sigismond von Herberstein wrote one of these accounts (Rerum muscovitarum Commentarii, Basel, 1556) and von Gaspard Schwenkfeld another (Theriotropheum Silesiae, etc. 1603).

Drawn Towards the end of this period an important series of monographs, now very rare in their complete state, were published by C.P.Thunberg ~~during~~ (1822-23) describing the faunal life of widely separated zoologic areas, among them America, Brazil, Japan, New Holland, China, the Guianas, et al.

In the year 1767 appeared a posthumous work by Salerne (d.1760), issued from Paris and entitled Histoire Naturelle ... L'Ornithologie. It was based on Ray's Synopsis and Newton, always chary of praise, speaks very highly of the volume.

Acting under Buffon's influence and subsidized by the French Government, D'Aubenton, between 1765 and 1780, published his remarkable atlas entitled Planches enluminées d'histoire naturelle, (already noticed) It appeared in 42 parts and pictured 1008 animals, mostly birds. It was certainly a tremendous undertaking and there is to-day no more imposing collection of hand-colored plates.

As the atlas was without accompanying text Buffon supplemented the work by his Histoire naturelle, générale et particulière, nine of the forty-four volumes being devoted to avian life. This arduous undertaking was begun in 1749 and was not completed until 1770, during which time Buffon had the assistance of several competent and careful collaborators. Too much praise cannot be given the author of this remarkable treatise, enlarging, as it did, every department of zoological research.

In 1827 Edward Griffith, a copyist of Baron Cuvier, wrote a respectable Animal Kingdom in 16 volumes that showed signs of original thought.

On the whole, the two Grays, George Robert (1808-1872) and John Edward (1800-1875), did more than any other systematists to place vertebrate zoology on an enduring basis. Their work in the British Museum and elsewhere is voluminous, catholic and reliable. Only a small part of their essays, catalogues, and other library titles are mentioned in this Introduction but most of them have been listed in the Catalogue and Index.

During this period, also, P.L.S.Müller (1725-1776) published a (translated and amended) edition of the Systema Naturae. Ten years later appeared the rare Table des Planches enluminéez, reprinted by Tegetmeier. In 1786 Scopoli published his Deliciae Florae et Faunae Insubricae, a rare work, also reprinted and based on Sonnerat's Voyage aux Indes, etc. (1872-1876). Two years later appeared Gmelin's celebrated compilation (the thirteenth edition) of the Systema Naturae. Another important general treatise on ornithology, issued in the eighteenth century was F.M.Daudin's Traité élémentaire, etc.

Very rare and yet fundamental is the Zoologia Indica Selecta of J.R.Forster, Halle, 1781, of which Tennant's Indian Zoology, London, 1790, is really an English translation amended and greatly enlarged.

Oology and its literature will not occupy much space in this Introduction although the appended Catalogue will be found to list most of the works on avian and reptilian eggs. One of the finest colored atlases depicting the former is F.A.L.Thienemann's Einhundert Tafeln von Vögeleieren, 1845-54.

The mammals, reptiles, amphibia, and birds of the Ethiopian Region (Africa in particular) have had extensive literary attention, and it is not possible to mention all the deserving works on the vertebrate fauna of all the provinces. Prominent among them are Sir Andrew Smith's Illustrations of the Zoology of South Africa (1838-1849), the second edition by Sharpe issued in 1884; Andersson's Notes on the Birds of Damara Land (1872); Holub and von Pelzeln's Beitrage zur d. Ornithologie Sudafricas (1882); Shelley's comprehensive Birds of Africa (1896-1912); Layard's Birds of South Africa (1867); Newton's article in the Encyclopaedia Britannica, 9th, edition; Reichenow's Die Vögel Afrikas (1904); von der Decken's extensive Reise in Afrika (1870); Canon Tristram's Fauna and Flora of Palestine; Rochebrune's Faune

de la Senegambie, (1884); Levaillant's Oiseaux d'Afrique,(1799-1808), and the fauna described in the Histoire physique, naturelle et politique de Madagascar (1875-1884) by Alphonse Milne-Edwards, Alfred Grandidier and others.

Road Report
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The period under consideration ~~transition period that~~ Nordenskiöld describes under the caption "from natural philosophy to modern biology", ~~may be said to have occupied the first half of the nineteenth century.~~ Prominent among the pioneers (and an early one) that contributed to its brilliant episodes was Erasmus Darwin (1731-1802), the grandfather of the illustrious Charles. He was a medical practitioner in Lichfield. He wrote many papers for the Royal Society but the treatise that made him most widely known (apart from his relationship to his famous descendant) and which was translated into several continental languages is his Zoonomia (1794), a peculiar but original thesis in which the author attempts to formulate the laws that govern the origin and progress of animal life.

Among the first of the comparative biologists in the modern sense may well be placed the versatile Étienne Geoffroy Saint-Hilaire (1772-1844). Born near Paris, he entered the priesthood but, despite this handicap, was appointed professor of zoology by the Republican Government and at once showed himself to be, among other accomplishments, a brilliant anatomist.

He accompanied Bonaparte to Egypt as zoologist and contributed to the immense illustrated folios of the Description de l'Egypte (q.v.) in which are recorded the activities of the numerous scientific observers on the exploration staff of Napoleon. Later he went, also under Napoleon's orders, to "collect" specimens from Portuguese museums to enrich the French State, much as his master was wont to "transfer" old masters from the galleries of Italy to the Louvre and similar collections. Saint-Hilaire's rivalry with Cuvier, in which Goethe supported the former, is well-known; it continued until Saint-Hilaire's death. His studies in comparative anatomy were mostly upon the osteology of vertebrates, while his speculations as to the evolution of the larynx and ear in mammalia and birds based on actual dissection, are likewise well known.

F It was in 1777 that Francesco Cetti wrote his several monographs on the vertebrate zoology of Sardinia.

Johann Friedrich Blumenbach (1752-1840) requires a few lines since, in addition to his studies in anthropology (Anthropological Treatises, etc. trans. 1865) he made valuable observations on the comparative anatomy of the higher apes and other animals; and his soubriquet of "Magister Germaniae" was in part given him because of his introduction into the Fatherland of this very study of comparative anatomy - several years before Cuvier introduced it into France.

The Chevalier de Lamarck (whose family name was de Monet) (1744-1825), cadet of a poor but noble family of Picardy, eventually rose to fame and wide influence in the scientific world. Of the many literary contributions he made to biology we are mostly interested in his Philosophie Zoologique, 1809, the 2nd. edition of which was published in 1830, and his earlier work, Recherches sur l'organization des corps vivants, 1802. In the former treatise he develops a theory of animal evolution - the development of life in nature - which suggests the coming of Darwinism.

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Baron Georges L.C.F.D.Cuvier (1769-1832) of French Huguenot extraction, was born in the Duchy of Württemberg. Although very poor he applied himself with absorbing diligence to his collegiate studies and rose during the Napoleonic era and after to occupy the most influential position in the world of natural science of any man of his country. His treatises on comparative anatomy, in the preparation of which he was greatly assisted by Dumeril (q.v.), and his essays on classification of the animal kingdom are too well-known to students of natural history to require extended comment. His Règne animal, 1817, passed through numerous editions and translations into all the European scientific tongues, many of which are shelved in the McGill libraries.

One must not pass over, either, his studies in paleontology. His celebrated work, Recherches sur les ossemens, 1812, is a work that ushered in the modern study of that science. ~~The most important titles of Cuvier's zoological contributions are listed in this Catalogue~~.

Of the many earlier nineteenth century histologists, whose researches became so much more efficient by the employment of modern laboratory methods, few devoted themselves largely to pure zoology. In passing, mention may be made of one of these - Theodor Schwann (1810-1882), a gentle soul, son of an obscure bookseller in a small Prussian town. He became professor in Louvain and Liege and is best known for this cell-theory, first fully developed in his Mikroskopische Untersuchungen der Tiere und Pflanzen. J.J.Walsh (Makers of Modern Medicine, 1907) gives a good account of the life and works of this eminent man.

Richard Owen (1804-1892), contemporary of Johannes Müller) was born in Lancaster, the son of a merchant. His fame as a naturalist seems about equally divided between comparative anatomy and paleontology, but his activities, as curator of the Hunterian Museum and as keeper of the Natural History Branch of the British Museum at South Kensington (until he was 80 years old) kept him in touch with all departments of biological research.

Johann Peter Müller, a pioneer in experimental physiology and one of the most popular and brilliant of German biologists, was born the son of a shoemaker at Coblenz in 1801. He took his degree in medicine and in 1830 was appointed professor of chemistry at Bonn, a position he held for nearly 30 years. His work in oceanic zoology and his researches in comparative histology interest us most especially as he (late in life) was engaged almost exclusively with (the lower) vertebrates. He published a well-known monograph on the lancet fish (~~W~~ amphioxus), and spent over nine years on the skeleton, nerves and muscle system of the Mixinoidei - those borderland vertebrae, a study of whose minute anatomy throws so much light on the structural development in the higher forms.

Mention has several times been made to the hundreds of works in all languages on "game" animals and their pursuit in the interests of so-called sport. These publications are among the earliest printed works on Zoology. ¶ Although the Compiler views with a mixture of contempt and wonderment the chase after inoffensive animals by man armed with high intelligence and high power guns, and although he can be seems unable to comprehend the cruel murder of beautiful and often useful fellow creatures for the mere gratification of the lust to kill, yet the ~~Compiler~~ freely admits that accurate accounts and records of fauna now under discussion are frequently found as part of these melancholy tales of slaughter. For this reason alone they are included in the present volume, in the hope that when the veneer of civilization (with which some humans seem to be very thinly smeared) is exchanged for the thicker varnish of a rational pity and a feeling of animal brotherhood, these publications and the acts that prompted will be only a memory ~~found only among the literature~~ of ~~the~~ centuries that have ~~long~~ passed away.

~~IX~~ IV

Chapter IX.

Important Zoological Treatises and Serials published during the Nineteenth Century.

Monographs on Local Faunas. — Text. books on Zoology. Reports of Explorations and Surveys — The Modern Literature of Vertebrate Bionomics.

Stannius — P. L. and W. L. Sclater — M. Neumann — reatises on Paleontology — Zittel — Cope — W. K. Parker — oodward and Smith — Flower and Lydekker — Ernest rgersall — Beddard — W. K. Gregory — . G. Elliott — H. F. Osborn — Scudder — Theodore Palmer. — . G. Bronn — Cuvier and Saint-Hilaire (by plew) — De Blainville — R. P. Lesson — T. H. Huxley — Giebel — Vogt (by) and Specht — Alex. Wilson — Prince Chas. L. Bonaparte — J. J. Audubon — Prince Wied-Neuwied — Monographs of Local American Faunists — Giraud — T. M. Brewer — P. R. Hoy — Bailey — Dawson — Lewis and Clark Expedition — Thos. Say — W. E. Leach — Edward Sabine — De Kay — S. F. Baird — P. Pallas — Nuttall — Reichardt — N. A. Vigors — N. A. Vigors — Capt. Beechy — C. P. Holbäll — Titian Peale — W. Gambal — Geo. A. McCall — (G. L.) Lawrence —

John Cassin — T. M. Brewer — S. F. Baird — Sir John
Richardson — Elliot Coues — Louis Figuier — British Museum
Handbooks — Wm. Bingley — Starke and Sclater — Jerdon —
Blanford — Anthropologic Journals and Treatises —
W. P. Pycraft — S. J. Holmes — W. Bateson — Local Societies
and their Organs — (American) Journal of Mammalogy — Laboratory
Experimentation — Heider and Korschelt — Louis Roule. —
Hertwig — Societies for the Protection of Animals — T. S. Palmer. —
Gilbert Pearson — Alex. Wetmore — Ray and Willughby Societies.

¶ It is a task of no small difficulty to choose from the luminous nineteenth-century literature on vertebrate zoology a satisfactory list of representative titles. However here are a few of the important. ¶ As early as 1856 H.Stannius wrote a very useful treatise on ~~the~~ amphibian anatomy, Zootomie der Amphibia.

A revival of interest in the distribution of animal life on the earth led to the appearance in 1896 of Lydekker's Geographical History of Mammals, Cambridge, followed by the Sclaters, father and son, who published (1899) in London their valuable Geography of Animals.

In 1862 J.A.Gaudry presented his classic treatise, Animaux fossiles et geologie de l'Attique.

In 1873 Kowalersky wrote his systematic treatise entitled Versuch einer naturlichen Classification der Fossilen Hufthiere.

Nicholson and Lydekker published in 1889 their useful two-volume Manual of Paleontology.

An ambitious project by Melchior Neumann of Vienna began to appear in 1899 - Die Stämme des Thierreichs. This natural philosophy of extinct animals is here treated by an eminent Austrian but, unfortunately, the great work was never completed and much of the published matter treats of invertebrates.

In 1898 Woodward and Smith published a classic text-book, Outlines of Vertebrate Paleontology, that should be known to all students of the subject.

On the whole the most important German treatise (later translated into English) that takes up the entire subject is von Zittel's Handbuch der Paleontologie, Leipzig, 5 vols., 1876-93.

A philosophic work, mostly paleontologic, is Chas. Depéret's Les Transformations du Monde animal, Paris, 1907.

Cope's Primary Factors of Organic Evolution, Chicago, 1896, furnishes the author's views on the relations of paleontology to Darwinism.

Several other popular and well illuustrated volumes on "animals of the world" appeared during 1884, Cassell's Natural History, N.Y., and the Standard Natural History, Boston. These works contain much of value to the student of mammology.

In 1885 W.K.Parker wrote his scientific treatise On Mammalian Descent.

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During 1859-1897 appeared the monumental and as yet unfinished systematic H.G.Bronn's Klassen und Ordnungen des Thier-Reichs, written in collaboration with several well-known zoologists. This fine treatise is noted especially for the attention to anatomic details.

In 1891 Flower and Lydekker issued their excellent work on Mammals, Living and Extinct.

During 1907 appeared the second edition of Ernest Ingersoll's dependable volume on the Life of Animals.

In 1910 W.K.Gregory wrote his monograph on the Orders of Mammals, N.Y.; and one must not forget the contribution on the same sub-class contributed in 1902 to the Cambridge Natural History series by Beddard.

D.G. Elliott's well-known Synopsis of Mammals was published at Chicago in 1901. It is a systematic and technical treatment of the subject. In 1910 appeared H.F.Osborn's Age of Mammals in Europe, Asia and North America.

In 1902 Beddard contributed his monograph on mammals to the well-known Cambridge Natural History.

In 1904 Elliott brought out his work - a very creditable one - on the mammals of the West Indies and Middle America.

Reference may again be made here to G.M.Goudder's Nomenclator Zoologicus, 1882-84, a most useful alphabetical list of all generic names to 1879, with a Supplement.

A reference work of distinct value to advanced students is Theodore Palmer's (1904) Index generum mammalium. One meets with it now and then in the form of the author's separate although it was first contributed, as No. 23, to North American Fauna.

Here the Compiler wishes to refer to, and to advise perusal by the student of important French monographs on mammals - that of Cuvier and Saint-Hilaire, Histoire naturelle des mammifères, Paris, 1824; the wonderfully illustrated treatise by De Blainville (1839-64) in four quarto volumes, Paris - Ostéographie des Mammifères, and the ten-volume treatise of R.P.Lesson, Histoire naturelle des Mammifères et des Oiseaux, the last-named one of the Buffon suites, first edition 1828, second 1840.

In 1871 T.H.Huxley brought out his well-known Anatomy of vertebrated animals, in which mammals are given a large share of attention.

Giebel, in 1874, contributed the article on Die Säugethiere to Bronn's Klassen u. Ordnungen des Thierreichs.

Voght and Specht published at Munich in 1883 Die Säugethiere in Wort und Bild, a widely copies and popular treatise, much of whose text and most of whose excellent plates formed the chief attraction of many a subsequently published domestic and foreign book on mammology.

We musb bear in mind that it was during this period that Alex. Wilson (1766-1813), J.J.Audubon (1780-1851) and Prince Charles Lucien Bonaparte (1803-1857) (most of whose works are found on the shelves of the McGill libraries) carried on their famous observations of American bird life and published their wonderfully illustrated treatises. The Compiler prefers to refer the reader to the annotated titles of these celebrated zoologists in the Catalogue rather than to attempt an evaluation of their works here.

An exception must, however, be made to Audubon's opus magnum the Birds of America (1827-38), elephant folio, 4 vols., 435 hand-colored plates, reproduced life-sized drawings. With the exception of the French Government Description de l'Egypte (q.v.) this huge atlas of American avifauna forms the largest volumes ever issued on vertebrate zoology. Moreover the life-size plates (determined by the measurements of the wild turkey-cock) are reproductions of the largest drawings of animals known to librarians. For more than a century it was believed that the Audubon drawings were the largest portraits of birds known to collectors - most of the originals of which are now deposited in an American Museum. This belief was held until the discovery in 1924 of several hundred life-size

paintings made by Lady Elizabeth Gwillim, Madras, 1800-06, of Indian vultures, eagles and storks, now in the Blacker collection. The reader is referred to the Catalogue for a further description of these unique originals.

About this time, also, Prince Maxmilian of Wied-Neuwied (1782-1867) visited various sections of the American continents and reported his zoological observations in a number of valuable and well-illustrated volumes, among them Reise nach Brasilien in den Jahren 1815-1817, 2 vols. with atlas, Frankfurt-am-Main. He also wrote a Reise in das innere Nord-America in .... 1832 bis 1834, also 2 vols. with atlas, folio, Coblenz, 1838-41, as well as a Verzeichniss der auf seiner Reise in Nord-America beobachteten Säugetiere, Berlin, 1862.

Several of the local American faunists - very numerous in the nineteenth and twentieth centuries - have been mentioned with their writings. Of the early writers we should not forget Jeremy Belknap (History of New Hampshire, 1792); Samuel Williams (History of Vermont, 1794); Samuel Hearne (Hudson's Bay to the Northern Ocean, 1795); all of importance; W.B.O.Peabody's Birds of Massachusetts, 1839; Giraud's Birds of Texas, 1841; the same writer's Birds of Long Island, 1844, are elsewhere commented on; J.H.Linsley's Birds of Connecticutt, 1843; Thomas Mayo Brewer's Birds of Massachusetts; the Bairds(Wm.M. and S.F.) Lists of the Birds of Carlisle, Penn:; S.W.Woodhouse on the Birds of the Southwest, later, also, by A.L.Heerman and T.C.Henry; Zadock Thompson's Natural History of Vermont ; P.R.Hoy's Birds of Wisconsin ; the Birds of Ohio by M.C.Read, as well as by Dawson and Robert Kennicott, and much later productions, Bailey's Birds of Virginia; Dawson's Birds of California, and the Birds of the State of Washington by the same author.

The earlier writers on the local fauna of North America were followed during the succeeding ~~fifty~~ 50 years by numerous successors who covered pretty thoroughly every state in the Union.

The Lewis and Clark Travels to the Source of the Missouri River, London, 1814, (and several other editions) must be mentioned here, inasmuch as Wilson made use of much of the material gathered by that famous expedition. This was done in conjunction with George Ord (1781-1866) whose important contributions to American ornithology are emphasized in Günther's Geography, 1815.

Thomas Say (1787-1834) and others also wrote upon the zoological results of several expeditions within the limits of the United States, for example an Account of an Expedition to the Sources of St. Peter's River in 1823, led by Long. Towards the end of the Wilson period Wm. E. Leach (1790-1836) and Edward Sabine (1788-1883) furnished reports on American Arctic fauna as a result chiefly of the exploring expeditions of Parry, Franklin and Ross.

Some of the later and numerous State publications had something more than a strictly local value; e.g. the important Zoology of New York in 6 vols., 1842-44, published by deKay in 5 vols. as part of the 20-volume Natural History of that State. Many other States followed the example set by New York.

An outstanding contributor to the zoological literature of America is the famous Spencer Fullerton Baird (1823-1887) who, as Secretary of the Smithsonian Institution for many years, was a recognised leader ib the scientific world. His labors and writings are too numerous for refrence here but his best known monographs on North American fauna appear as contributions to government publications, both State and Federal, among them the Mammals of North America, 3 parts, many colored plates, 1859; a Catalogue of North American Birds, etc., 1858; Birds of North America, Phila., 1860, written in conjunction with J. Cassin; and A. History of North American Birds, with T.M.Brewer and Robt. Ridgway, 3 vols., Boston, 1874. Most of Baird's important publications appear as reports of various Explorations and Surveys undertaken by the U.S.Government, and are shelved in the McGill Libraries.

To this period belongs also Peter Pallas' celebrated, rare and valuable 3-volume Zoographia Rosso-Asiatica (1881-(42)] with its second edition, reprints and addenda. This treatise and others by the same author are very important for American zoologists as they describe many new Arctic species, especially those faunal forms that are now (or were) found in Alaska.

In this Catalogue and elsewhere in the Introduction the Compiler has given brief notices of the works of three more zoologists who contributed so remarkably to the Audubon period of American faunal literature - Richardson, Swainson, and Nuttall. To these one must add at this juncture the contributions of the Danish naturalist, J.C.H.Reinhardt (1776-1845) on the fauna of Greenland (1838); the report by N.A.Vigors (1839) on the zoology of Capt. Beechey's famous Voyage; the description by C.P.Holbäll (1795-1856) of the avifauna of Greenland and the equally important contributions to the faunal life of America by S.W.Woodhouse, William Gambal, George A.McCall and Titian Peale.

It was about this time that four names of American zoologists - several times mentioned elsewhere in this Introduction - shine with a scientific light of the same quality as that with which Wilson, Audubon, and Bonaparte illuminated the world of vertebrate zoology. They are Cassin, Baird, Lawrence, and Brewer.

John Cassin (1813-1869) is best known for his zoological (especially ornithological) reports on the Wilkes Exploring Expedition, on Commodore Perry's Japan Expedition, on the Gillis Expedition to Chili and for his Illustrations of the Birds of California (1853-56) - a large octavo volume with ~~fifty~~ 50 colored plates. The outstanding character that was especially Cassin's is his equal familiarity with Old World and Neotropical species. His works should be carefully reviewed by students of vertebrate zoology. Among the minor and yet important works of this naturalist is the series of catalogues (1849-53) of birds in the collections of the Academy of Natural Sciences, Philadelphia.

George Newbold Lawrence (1806-1895), one of the Couesian 1853-58 triad (comprising in addition Baird and Brewer), is best known to us for his work on the ornithology (and mammology) of Central and South America, and for his collaborations with his two compeers. Full justice to his several activities is furnished in L.S.Forster's Biography of this well-known writer.

Thomas Mayo Brewer (1814-1880), another person of this trinity, who apart from several treatises written in conjunction with others, distinguished himself as the father of North American oology, his published work (pp.140 and 5 pl.) on that subject unfortunately proceeding no further than Part I, 1857. It was in 1874 that he published the first part of his famous History of North American Birds, to be completed by others after his death.

Although mention has several times been made of the zoologica americana entirely produced or mostly inspired by versatile writer and naturalist Spencer Fullerton Baird (1823-1877) he still deserves, what lack of space forbids, another page all to himself. The reader is advised to make himself acquainted with the celebrated Pacific Railway Reports. The volumes devoted to zoology are not only useful for a study of North American fauna but they cast much light on the career of Professor Baird. For his other numerous single and conjoint volumes the student is referred to G.B.Goode's biography as well as to the titles in the appended Catalogue.

At this juncture the Compiler desires to draw attention to that magnificent series of monographs entitled Fauna Boreali-Americana; or the Zoology of the northern parts of British America, 3 vols., (4 pts.), many colored plates, edited 1829-37 by Sir John Richardson. He wrote on the fishes, quadrupeds and, in collaboration with W. Swainson, the birds. Richardson was an indefatigable explorer and writer on the zoological results of the expeditions in which he took so prominent a part. These included the two governmentally con-

ducted voyages to the North Pole in search of Franklin and (in 1845) another made chiefly on his own responsibility. The records of these voyages will be found in the appended Catalogue.

In many respects Elliot Coues (1842-1899) was the most brilliant writer on vertebrate zoology America has so far produced. Certainly his Field Ornithology (1874) and his Key to North American Birds (1872) with their numerous subsequent editions are still the standard text-books for students of North American bird life, while his famous List of Faunal Publications relating to North American Ornithology (down to 1880) has so far been unsurpassed. One must bear in mind his Fur-Bearing Animals (1877) and other treatises that bear evidence of his wide knowledge of faunal life in general. His many contributions to the literature of vertebrate zoology are listed in the appended Catalogue.

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In 1850 John E. Gray wrote his Hoofed Quadrupeds (as part of the Knowley Hall output) with 62 colored plates.

Typical examples of popular and well-illustrated works on vertebrate zoology on the market in recent years are two series published in America during 1884. These are Cassell's Natural History, N.Y., and the Standard Natural History.

As a contribution to comparative psychology, K. Groes has given us an entertaining book, The Play of Animals, 1900.

In 1901 Lucas contributed a popular but serious contribution to paleontology, Animals of the Past, N.Y.

A mention may once more be made of that extensive, popular treatise, Hutchinson's Animals of the World.

During 1837 H.G.L.Reichenbach contributed to German faunal literature his Deutschland's Fauna, the first and second parts being devoted to mammalia and birds.

In 1828 Müller published his Entwicklungs-Geschichte der Thiere, in which the reptilia receive their proper share of attention.

The important atlas of C.J.Lorek appeared in 1834-37, entitled Fauna Prussica and depicts (130 col. pl.) the principal faunal forms of North Germany.

Thomas Huxley, in 1871, published his famous Anatomy of Vertebrated Animals, long to remain a popular text-book on that subject.

Although they are not regarded as strictly scientific literature yet one must not pass by the interesting, rather early and much translated series of books, mostly on prehistoric zoology, by Louis Figuier, full titles of which are listed in the appended Catalogue.

For the past half-century the Trustees of the British Museum have published a long array of Catalogues and Handbooks on Vertebrate Zoology that have been of incalculable value to students and systematists. They are rich sources of information upon which innumerable book-makers have drawn for materials both textual and illustrative. Every natural history library should have and every advanced student of vertebrate zoology should familiarize himself with these indispensable monographs.

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In 1900-1906 Starke and Sclater published their classic work on the Fauna of South Africa.

Quite worth the student's attention is T.C.Jerdon's Mammals of India, 1867.

A very useful work is Blanford's Zoology of Persia, London, published in 1876, followed (1888-91) by the volumes on Mammology in the Fauna of British India.

During this period, also, appeared numerous travelers' accounts of Asiatic natural history, among them Alcock's Naturalist in the Indian Ocean; Hickson's Naturalist in the Celebes; Siedlecki's Java, and many more of the same type.

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Although the Compiler has no intention of recording even the principal works on anthropology that are to be found on the shelves of the McGill libraries, a few titles in the Blacker Library are especially ~~available to~~ desirable for students, among them several sets of periodicals - the Journal of the Anthropological Institute of Great Britain and Ireland, 1872 to date; The Anthropological Review, 1863-70; Transactions, Journal and other publications of the Anthropological Society of London, 1863-71; Man, as well as such monographs as Huxley's Man's Place in Nature, 1863; J.F. Blumenbach's Anthropological Treatises and ~~this~~ similar works, for which consult the Student's Index.

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Use will be refused to any student of this section of undergrads

Somewhat later there was published a work of classic importance, W.P.Pycraft's Courtship of Animals, published in 1913.

S.J.Holmes' Studies in Animal Behaviour published in 1916 is well worth the student's attention.

Still later appeared a text-book by T.H.Morgan and others, The Mechanism of Mendelian Heredity, 1919.

One of the best authorities on animal heredity is W. Bateson, whose works are listed in the appended Catalogue.

In 1920 was published the two-volume edition of Dendy's System of Animate Nature.

E.N.Harvey published, also, in 1920, The Nature of Animal Life.

Many of the British local societies issuing worthwhile zoological periodicals have been mentioned but many more remain to be noted, among them the Cardiff Naturalists' Society, founded in 1867, with Transactions regularly published since 1870. Another of the lesser organizations that might be mentioned, as typical of a hundred others, is the Woolhope Naturalists' Field Club (founded in 1851) whose Transactions have been regularly issued since 1856.

Reference has before been made to the many local natural history societies in all countries and their numerous publications - mostly popular in character. These associations are unusually common throughout German lands, a typical example being the Naturforschender Verein in Brunn whose Verhandlungen have been regularly published since 1863.

The Société d'Histoire Naturelle of Colmar, founded in 1859, has been publishing its important Bulletin since 1860.

Reference has been made to several South American foundations of importance in a study of vertebrate zoology. One of these is the Argentine Museu Nacional (founded in 1818) whose Archivos and Revista have appeared since 1876.

In addition to the American Societies and their publications elsewhere noted the Buffalo Society of Natural Sciences, founded in 1861, has published its important Bulletin since 1873.

In 1853 was founded a very important American center for natural science research, the California Academy of Sciences; since that date the Academy has regularly issued Proceedings and (later) a Bulletin.

In 1860 was founded the now famous Museum of Comparative Zoology, at Harvard University. Since 1861 it has published a number of periodicals of great value to students of vertebrate zoology, chief among them the Bulletin (1863) and Memoirs (1864). The most important special periodical published in the U.S.A. on the subject of its title is the Journal of Mammology, organ of the American Society of Mammalogists (founded in 1919).

Among the comparatively recent societies of Italian origin is the Accademia Gioenia di Scienze Naturali of Catania, founded in 1824 and publishing several periodicals, Atti and Bullettino, since 1825.

A recent foundation in Italy (1900) is the Unione Zoologica Italiana that has published the Archivio Zoologico since 1902.

Once more and before leaving the subject, the Compiler draws the attention of librarians and research students to the fact, not sufficiently emphasized, that the publications of the Natural History Department of the British Museum offer extremely valuable and informative scientific literary material in most sections of biology. This Introduction and Index cannot, unfortunately, do more than mention a small fraction of these invaluable publications, but the Compiler advises the advance student in particular to search the British Museum and this Catalogue for such additional zoological titles upon which he may be seeking information.

The literature of zoology has, in recent years, recorded the results of laboratory experimentation, especially along evolutionary and hereditary lines. A good review of this work is found in Cunningham's Modern Biology. Treatises, essays, reports and articles on ecology, physiology, biochemistry, embryology, histology, cytology, economic zoology, and experimental zoology ~~Journals~~, also show a decided increase, especially as monographs and in periodical writings, thus emphasizing the contention of the Compiler, elsewhere stated, that by far the most important and up-to-date portion of our twentieth-century literature on the varied relations of vertebrate zoology is to be found in serials, magazines and journals devoted to that subject.

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foot note

1 In this connection the student should have access to the valuable Journal of Experimental Zoology.

Of the many modern text-books on the comparative embryology of vertebrates listed in the present Catalogue, some of which have already been mentioned in this Introduction, the four-volume Lehrbuch of Heider and Korschelt (1902-10) is to be recommended to the advanced student.

One of the most complete and erudite of the many treatises on embryology with a basis in comparative anatomy is Louis Roule's L'Anatomie comparée, etc., 1898. A another and ~~perhaps~~ better known treatise on the same subject is ~~by~~ Hertwig's Lehrbuch der Entwicklungsgeschichte, 6th ed., 1898.

Societies for the care of and prevention of cruelty to animals have been founded in most civilized countries and their organs for propaganda regularly published. Among the best known are the Humane Society and the Society for the Prevention of Cruelty to Animals in England. In Italy, as a further example, the Assoziand romana per la protezione degli animali, as well as ~~the~~ a recently organized ~~[illegible]~~ Society for the Protection of Birds ~~in Italy~~, have been formed and are doing admirable work.

The literature of bird protection has several times been mentioned in the present volume; and many societies have issued (propaganda) literature and ~~numerous~~ periodicals devoted to the good cause, the bulletins and transactions of the Royal Society for the Protection of Birds in England, and the Audubon Societies in America, for example. Similar associations, with their attendant literary output, have long been established in Germany and elsewhere in Europe. Practically all these sets of serials and journals are listed in the appended Catalogue.

Of the many essays on bird protection in America is Theodore S. Palmer's Legislation for the Protection of Birds, Washington, 1900.

The recently formed (1929) International Committee for Bird Protection has issued a Bulletin under the editorial management of Gilbert Pearson which surely will be productive of much good.

The protection of animals, whether avian, mammalian or piscian, from their most dangerous and persistent enemy - man - is an end devoutly to be wished. The human creature, with all his boasted development from the troglodyte condition, is still a savage. ~~with a thin - very thin - veneer of civilization.~~ The urge to adventure on mountain, jungle or sea that some unfortunate animal, especially if attractive because of ~~its~~ its superior size, beauty or supposed food value, may be murdered secundum artem cannot be resisted by the so-called sportsman. The lust to kill for the sake of killing, ~~is still rampant among~~ dominates many a man, otherwise a model citizen, a kindly husband and an excellent father. These contradictory elements in human character seem to justify the poet's lines:—

"The more", said one, "of men I see
The more do dogs appeal to me".

the establishment of sanctuaries, gun-club rules and the passage of local, federal and international laws. If this "sport" - legal and illegal - continues as it is now carried on, in twenty years such birds as the beautiful Wilson goose will be as rare as the Sandhill Crane or the Trumpeter Swan.

An attempt to preserve threatened faunal life in general is the purpose - rather vain, perhaps - of the Conférence Internationale pour la Protection de la Nature, whose illustrated Receuil des Procès-Verbaux of the 1913 meeting, pp.247, was published in Berne in 1914.

What the outcome of the present propaganda now carried on chiefly by Gilbert Pearson in a similar effort for the preservation of avian life, remains to be seen. In any event the attempt is at least an advance on the previous world attitude - viz. indifferenee to and complete ignorance of even the difficulties of the problem.

¶ In addition to the remarks elsewhere made on the subject of the protection of animal life, it is

¶ As pointed out by Dr. Wetmore (Encycl. Brit., 14th ed., p.918) that bird protection, when properly enforced, is a potent factor not only for the salvation of species but in greatly increasing the numbers of many useful birds. He says that in the United States "there are 76 bird reservations under jurisdiction of the Department of Agriculture, ranging in size from a few acres to several hundred square miles, while light-house reservations, national parks, and similar tracts under supervision of other governmental departments have also been designated as bird preserves. In addition, various States are now developing the idea of game sanctuaries which are also refuges for birds. Pennsylvania, at the present time, has 88 sanctuaries of this kind, including nearly 73,000 acres. Private sanctuaries are also multiplying and afford much protection; many have been established as local enterprises by cities, towns, or by groups of private individuals." ¶ The United States Governments, in conjunction with private enterprise, are doing what they can to prevent the extinction of that largest of the deer, the American Elk (Wapiti), of which about 40,000 head still survive of the vast herds that once roamed the mountains of North America. Starvation, as the result of unusual winters, restriction of feeding areas and the savage butchery by "Sportsmen" during the "off" season of unprotected herds, are slowly reducing the numbers of this beautiful, inoffensive mammal.

¶ The student of faunal literature has been much assisted by the formation of Societies for the reprinting and editing of rare books, and occasionally for the publication of manuscript treatises that held no prospect of financial gain. Of these useful and numerous associations in Europe and America the Willughby Society and the Ray Society (founded in 1844) stand preeminent. Among the first issue of the latter was the Bibliographia Zoologiae of J.L.R.Agassiz, edited by H.E.Strickland (q.v.).

2nd Proof

CHAPTER X

Some important Zoological Treatises published during the Nineteenth Century, continued. Monographs on Local Fauna. Textbooks on Vertebrate Zoology. The Literature of Vertebrate Bionomics.

Reports on Captain Cook's Voyages — Pallas — Pennant — Lyonnet — De Geer — O.F.Müller — Cavolini — Della Chiaje — Ledermüller — A. Tremblay — Lamarck — R. Owen — Agassiz — Johannes Müller — J.H. Blasius. — Rathke — Meckel — J.V.Thompson — the Van Benedens — Claparède — Dalyell — Sars — Allman — Inventors of classifications schemata — H. Milne-Edwards — R. Leuckart — Thos. Huxley — The Microscopist-naturalists, von Leeuwenhock and Malpighi — Works of the morphologists, Carl G. Carus, Kielmayer, Gotthilf Fischer, Daellinger, F. Tiedemann, Bojanus, J.F.Meckel and C.A.Rudolphi — Treatises on biochemistry by Theodore Schwann — Bionomics — The Far East in Nineteenth Century Zoological Literature. — Belanger. —

The Siebold Family — Temminck and Schlegel — Mauritius and its Naturalist Visitors — African Zoology — Andrew Smith — W. L. Distant — Clapperton and Denham — W. C. H. Peters — Von der Decken — Napoleon's Description de l'Egypte — Ehrenberg and Hemprich — P. E. S. Rüppell — E. Fenzel — P. Bleeker — C. T. Lefèbvre — M. T. von Heuglin — M. F. Wagner — W. L. Sclater — Webb and Berthelot — Bory de Saint-Vincent — R. T. Lowe — Robert Ridgway — Ornithology of Hawaii — Zoology of the West Indies — Léotaud — Charles Cory — Lambeye — Alex. Wetmore — Literature of Canadian Fauna — de la Hontan — Thos. Nuttall — Mc Ilwraith — Taverner — Ross. — Chamberlain — Elliot Coues — Bendire — Examples of Monographs etc on particular Species and Genera — Paleontology — R. Owen — Woodward family — C. G. Ehrenberg — Dictionaries of Natural History — P. H. Gosse —

The interval in time between Linnaeus and Darwin is marked by numerous and important additions to the literature of zoology. A few of these have already been mentioned; others are Solander and Banks, who reported on the zoology of the first of Captain Cook's famous voyages; Peter Simon Pallas (1741-1811), writer on the fauna of Siberia; Thomas Pennant, famous for his descriptions of British fauna; Lyonnet (1707-1789) and De Geer (1720-1778), both naturalists of note; O.F.Müller, Cavolini (1756-1810), Della Chiaje (fl. 1828), Ledermuller (1719-1769) and Abraham Trembley (1710-1784) - all observers adding to the literature of lower-animal - mostly aquatic - forms of life.

The publication of the Linnean system greatly stimulated definite descriptions of zoological types and a decided improvement was henceforth noticeable in the literary quality of monographs on zoological subjects.

¶ Another product of the nineteenth century several times mentioned, and perhaps the best known of Cuvier's disciples, is Richard Owen (1804-1892), a great authority on the paleontology, morphology, and histology of many forms of faunal life. In common with the writers above mentioned Owen published a classification picturing his views of the relationship of members of the animal kingdom, all of which is reflected in the zoological literature of the writer's day and generation.

Here the Compiler draws attention to the extensive and valuable zoological works of the distinguished Russian writer, J.F.Brandt. Among his treatises in the Blacker Library are Mammalium exoticorum ... descriptiones et icones, 1835, and Descriptiones et icones Animalium Rossicorum, 1836.

About this period the teachings and writings of German zoologists became prominent in the scientific world, and we note a corresponding change in and additions to theoretical classifications that, in the main, were built upon histological research in which the microscope played the most outstanding role. Agassiz in his Essays on Classification (1859) gives a fair account of these publications.

The name of that brilliant genius Johannes Müller (1801-1858), often recurs in these pages. He was probably the greatest investigator of the internal structure of animals, and one associates his name with that of his predecessor Rathke (1793-1860) and of Meckel (1781-1833). Of Müller's numerous and important memoirs that on Amphioxus, Berlin, 1844, may be cited as a model of accurate and complete scientific observation and illustration.

Somewhat later (1857) J.H.Blasius published his Säugethiere, an 8vo. (octavo) of 550 pages, as part of a general zoology of Middle Europe.

Among other writers of this period was the Army Surgeon, J.V.Thompson, whose papers on marine invertebrates are in a class by themselves. With him may be mentioned, as students of Oceanic fauna, the senior Van Beneden, Claparède, Dalyell, Sars and Allman.

There , during this period,
~~There~~ follows a long array of important investigators and writers at least three of which are distinguished as the inventors of classification systems well known to students of zoology. These are Henri Milne-Edwards (1800-1884) (see, in particular, his Recherches anatomiques, 1845-49, and his Anatomie comparée, 1857-81); Rudolph Leuckart (1823 -); and Thos. Huxley (1825-1895), whose monographs dealing with their particular systems are listed in this Catalogue. Of these three classifications that of Huxley has influenced most the changing nomenclature of our present-day systems. He it was who insisted that a rational classifying of fauna should comprise with meticulous accuracy the whole structure, microscopic as well as gross, all animal forms, including not only their adult structures but their development ab ovo to maturity.

Jno. Kirke Townsend (1809-1851) wrote a famous Narrative of a Journey across the Rocky Mountains, etc. 4to, Phila., 1839, in an appendix to which is a list of the quadrupeds and birds found in the territory of the Oregon. There, also, notes on the fauna of the Sandwich Islands, Chile, etc., are catalogued. A London edition illustrated, in 2 volumes, was issued with a title somewhat different in 1840. Both works are rare and important. In 1849 appeared the first and only part (pp.12, pl.4, Phila.) of his Ornithology of the United States - very rare.

¶ Another name elsewhere honored in the present Introduction is that of Thomas Henry Huxley (1825-1895), the son of a poor schoolmaster, born in London ~~and~~ he became one of the most famous biologists of his day. He served as surgeon in the English Navy and while in Australian waters examined the animal life so abundant in that quarter of the world. He afterwards taught comparative anatomy as part of his duties when appointed professor at the British School of Mines, whence he wrote several text-books and conducted lecture courses that added greatly to his fame. Perhaps he will always be best known, in a literary sense, by his classic Evidence of Man's Place in Nature, 1863.

Physiology based on structure - or anatomical physiology, really had a beginning - albeit vague and cloudy - in the writings of the ancient zoologists, and we discern it in the works of Aristotle and Galen. The subject actually belongs in the domain of medicine, for the study of which the reader is referred to the Bibliotheca Osleriana.

In the Bibliotheca the student of comparative physiology will find at first hand the titles of all the essential literature on this important subject from the earliest to the latest times.

As the Compiler has several times remarked, the discovery of the clinical microscope and other modern methods of research made possible not only accurate descriptions of minute organisms but the scientific observation of cell-structure in animals; and it again stated – Anton von Leeuwenhoek (1632-1723) and Marcello Malpighi (1628-1694) were the first to make an extensive use of the microscope for these purposes.

¶ While on the subject of vertebrate morphology

One must not forget in this connection the works of François Joseph Schelver (1778-1832) who published several ~~philosophic~~ related treatises on insects and worms; of Gotthiel Heinrich Schubert (1780-1860), a rather vague and speculative naturalist; Carl Frederic Burdach (1776-1846) who wrote on the habits of animals; Carl Gustav Carus (1789-1869) whose Lehrbuch der Vergleichenden Zootomie, 1834, has passed through several editions and has been translated into English, and French; the morphological studies of that versatile genius Goethe; and Carl Heinrich Kielmeyer (1765-1844), another comparative anatomist, to whom Humboldt dedicated his "Zoological Researches".

Another morphologist of some note is Gotthilf Fischer (1771-1853), whose works had a wide range from fishes to geology and paleontolohy. About this time also appeared the papers of Daellinger on comparative morphology and, following him, F. Tiedemann (1781-1860) made many and varied contributions to the same study. L.H.Bojanus (1776-1827) must not be passed over, as adding embryology to his other comparative studies; nor should J.F.Meckel (2nd,) member of an illustrious family of medico-naturalists, be forgotten because of his devotion to the study and teaching of comparative anatomy. He worked under Cuvier and eventually became a famous professor in Halle, where he edited his well-known Archiv. C. Asmund Rudolphi (1771-1832) a teacher of Johannes Müller, was another comparative anatomist of note.

~~Several times reference has been made to the value of dictionaries and encyclopedias wholly or in part devoted to natural history. One of the earliest of these is George Montagu's Ornithological Dictionary, the first edition issued in 1802 with many subsequent printings and revisions, all of which are represented in the Catalogue.~~

Biochemistry (with its attendant literature) an important department of zoology much studied in recent times, had its inception in the cell-theory and other works of Theodore Schwann (1810-1881).

Bionomics, about which Charles Drawin was the first serious writer, had a forerunner in ~~the famous~~ Count George L.L. de Buffon, ~~(1707-1778)~~ whose extensive writings are largely devoted to the habits of animals and their relations to their immediate surroundings rather than to questions of structure alone. Of all the writers before and since Darwin's time Buffon stands pre-eminent as a student of what we now know as bionomics.

It was during this period that the vertebrate zoology of insular and continental India was studied by a large group of British naturalists who reported upon it in special journals, serials and monographs. These well-known names all appear in the Catalogue, among them Horsfield and John McClelland.

About this time a French traveler, Charles Belanger, published his Voyage aux Indes-Orientales, 1834, with a folio atlas, that deals in part with the zoology of Java, Mauritius and portions of India. We are indebted to Captain Hugh Falconer (1808-1865) for numerous brochures on the fossil fauna of the Far East (and other localities), especially his Fauna Antiqua Sivalensis, etc., and Illustrations, 1846-49, London, that treat extensively, with Sir P.T.Cantley, the paleontology of North India.

Another explorer of the Far East was Philipp Franz von Siebold (1796-1866), who is not to be confused with an equally distinguished naturalist, Carl Theodor Siebold (1804-1885), or with his father Christof, professor in Würzburg. His chief work on the animals of Japan is entitled Fauna Japonica, etc. Lugd. Bat. 1833-50, a 6-vol. folio in which C.J.Temminck and H. Schlegel collaborated for descriptions of the vertebrata.

6-volume

Madagascar has always been a favorite island for the voyaging faunist. One of the early nineteenth century reports on its animal life is furnished by Julien F. Desjardins (1799-1840) who, among other contributions, wrote a Rapport Annuel sur .... l'histoire naturelle de l'Île Maurice, 8vo., 1835-36. Shortly before, J.B.Bory de Vincent (1780-1846) visited the island and described the Mauritian and neighbouring fauna in his Voyage dans les quatre principales îles der mers d'Afrique, 1803, 3 vols. 8vo.

Martin H.C.Lichtenstein (1780-1857), born in Hamburg, while serving as a doctor in the Dutch service spent most of three years in South Africa and contributed to our knowledge of its zoological life. He became better known as professor of Zoology in Berlin, in charge of the UniversitycMuseum. So far as concerns his work in South Africa it is largely dealt with in his Reisen im südlichen Africa, 2 parts, Berlin, 1811-12.

Reference has already been made to the life and writings of Sir Andrew Smith (1797-1872) to whom the world of natural science is greatly indebted for his faunal literature relating to South Africa. His chief monograph is Illustrations of the Zoology of South Africa, 5 vols., 1834-36.

Much later, with with the same end in view, is W.L.Distant's Naturalist in the Transvaal (1892) in which the mammalia, aves, reptilia and batrachia of South Africa are systematically described by competent specialists.

An expedition to the Congo, during which some attention was paid to the fauna of the regions visited, was made by James Kingston Tuckey (1776-1816), In this Narrative of an Expedition to explore the River Zaire, 4to., London, 13 pl., 1818, J. Cranch gives "A general notice of the Animals."

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Hugh Clapperton (1788-1827) made several incursions into the wilds of central Africa, accounts of which (with a description of the animals seen and secured) were given by him and his associates in two-volume works. With D. Denham he published, 1826, two editions, Narrative of Travels ... in northern and central Africa, 1822-24.

Among the more important contributions to nineteenth-century literature of vertebrate zoology of Africa and neighboring regions are those of Wilhelm C.H.Peters (1815-1883) the successor in Berlin of Lichtenstein. His Naturwissenschaftliche Reise nach Mossambique, etc., 4to, Berlin, 1852-82, in which the fauna is elaborately catalogued is, perhaps, his best work. In conjunction with Carl C. von der Decken (1833-1865) he described the mammalia of that naturalist's well-known Reisen in Ost-Africa in 1859-61, 4 vols. This fine work also includes a history of the fauna of the African coastal regions - Zanzibar, Mezambique, etc.

The faunal discoveries, many of new species, by Carlo Fornasini in Mozambique, were examined and described by Giovanni G. Bianconi (1809-1878) under the caption Specimina Zoologica Mosambicana, etc., Bonon., 1850-70.

After their return from the famous military-scientific expedition into Egypt, made under the first Napoleon and (as previously mentioned) described in the monumental Description de l'Egypte, Histoire Naturelle, 4 superfolio vols., a group of naturalists that included that zoologists E. Geoffrey Saint-Hilaire, M.J.C.L.Savigny, Friedrich W. Hemprich (1796-1825) and Christian G. Ehrenberg (1795-1876) either continued and extended their studies of Egyptian animal life or turned their attention to the fauna of neighboring regions, especially the African. A second edition, much inferior to the first, was issued by the Bourbons. This was the origin of the well-known Symbolae Physicae seu Icones etc Pars zoologica, Berol., 1828-45, that Ehrenberg and Hemprich (assisted by others) brought out in 4 vols., with numerous colored plates, in which the fauna of northern Africa, Arabia, Syria, etc. are fully described and depicted.

Another prominent zoologist who is widely known for his studies of African fauna was Wilhelm P.E.S.Rüppell (1794-1884), whose Atlas zu der Reise im nördlichen Afrika, folio, 1826-28, has the first part devoted to the zoology of the expedition. The author also published monographs on the birds and mammals of Abyssinia and other African countries; in fact he is among those numerous writers whose works must be studied by all serious students of African biology.

Another naturalist who traveled much in the countries bordering on the Mediterranean and recorded his discoveries and observations on the animal life of the East was Joseph von Russegger (1802-1863). With the aid of J.J.Heckel and other systematists he published his Reise in Europa, Asien und Africa ... in den Jahren 1835 bis 1841, etc. 4 vols., Stuttgart, 1841-48. The natural history portion of this useful work has been reprinted under the editorial management of E. Fenzel and others.

Although he should rank among the most celebrated of ichthyologists in general P.Bleeker is best known for his magnificent treatise, the nine-volume folio Atlas ichthyologique des Indes Orientales Neerlandaises, 1862-72, a famous work published at Amsterdam, and illustrated by 420 folio colored plates.

Abyssinia was the chief objective of a scientific expedition under C. Théophile Lefèbvre (1811-1860) reported upon under the title Voyage en Abyssinie. This work, in 9 volumes, Paris, was published in 1845-51, and illustrated with over 200 plates.

Among the better known faunists who wrote much about the animals of Africa was the naturalist Martin T. von Heuglin (1824-1876). His travels and discoveries are described in several publications, at least two ornithological, and in numerous contributions to serials and periodicals. A number of these will be found - as is the case with quite a few of the foregoing titles - in this Catalogue. Here the Compiler will mention only this writer's Ornithologie Nord-ost-Afrikas, etc., Cassel, 1869-73, a classic work on this subject.

As a result of his travels in northern Africa, Moritz F. Wagner (1813-1887) published Reisen in der Regentschaft Algier, 1836-38, 3 vols., Leipzig, with an Atlas, in which the fauna are, among other subjects, systematically described and figured. Subsequently the French government organised a scientific survey of the same territory and published Exploration scientifique de l'Algérie pendant les années 1840-42. This report was published in Paris, 1846-60, the birds and mammals being described by Levaillant, the fishes and reptiles by A. Guichenot.

Finally, and as a supplement to this all-too-brief account of the early explorers who wrote on African Zoology, the reader is referred to W.L. Sclater's excellent article, 'Early Sources of our Knowledge of African Ornithology' (Jour. für Ornithologie, Bd. 2, 1929).

The Canary Islands and their faunal life to some extent depicted by Alexander Humboldt, were more fully described by P.B.Webb and S. Berthelot in their Histoire naturelle des Îles Canaries, 1835-44, in 3 vols., and an Atlas of 438 plates. This rather rare and extensive work was issued in 108 parts, the ornithology being detailed mostly by the principal editors (and M.A. Moquin-Tandon); the reptiles by M.P.Gervaise and the ichthyology by M.A.Valenciennes. That indefatigable explorer and naturalist, Baron J.B.Bory de Saint-Vincent, had given us, also, an earlier report entitled Essais .... ou précis de l'histoire générale de l'archipel des Canaries, Paris, 1803.

The Madeira group has been fairly well explored and its fauna listed during the nineteenth century. One of the best histories is that of Richard T. Lowe (1802-1874), who wrote Primitiae Faunae---Maderae et Portus Sancti, etc., Cambridge, 1831, also another edition with appendix in 1851, as well as a History of the Fishes of Madeira, 8vo., London, 1843-60, with 17 colored plates.

¶ Several references have been made in this Introduction to the ~~another bright star in the firmament of~~ that celebrated) Smithsonian, ~~firmament was~~ Robert Ridgway (1850-1929). ~~He was a worthy successor and a junior partner of the zoological trio just referred to.~~ Although his most enduring work is the monumental Birds of North and Middle America, 8 vols., (1901-27), unfinished at the time of his death, the Catalogue annexed to this Introduction credits him with a notable Color Standard (two editions) for zoological descriptions; A Manual of North American Birds (1st. edition, 1887); the Ornithology of Illinois, 1887; as one of the editors with Brewer and Baird of their fine treatise (already mentioned) and of numerous other contributions to the various Smithsonian publications. ~~These additional titles are mostly listed in the accompanying Catalogue.~~

The ~~Ednal~~ avian literature of the Hawaiian Islands may here be noticed once more. It is in part represented by ~~the most important being~~ the well illustrated works of Lord Rothschild's Avifauna of Laysan, 1893-1900; the monographs of Evans and Wilson, Aves Hawaiienses, 1890-9; ~~and~~ the small, popular handbook of H. Henshaw, Birds of the Hawaiian Islands, 1902, and ~~also~~ a useful Key to the Birds of the Hawaiian Group, 1901, the work of W.A.Bryan.

~~Bibliography~~ The Spanish Mainland ~~and [illegible] Indian Islands [illegible]~~ has been the subject of many treatises, the most popular of which is probably Waterton's Wanderings, that has been many times reprinted since the first edition ~~of~~ 1825. Next in order of importance is Richard Schomburgk's Reisen in Britisch-Guiana (1848) which has recently been translated from the Dutch and German editions by the Compiler's friend, Dr. Walter Roth, Curator of the British Guiana Museum in Georgetown, B.G. The original MS of that translation is now in the E.S.W.Library.

Léotaud's Oiseaux de l'Île de la Trinidad, and Gosse's Birds of Jamaica (1847) are examples of early local works on the avifauna of the West Indian islands. The latter is a charming work. The Blacker Library is fortunate in possessing the original drawings from which Gosse's (subsequent) Illustrations (1849), a sort of atlas to the text, were produced - delightful, illustrative, colored drawings. The small folio of text has itself become exceedingly rare.

Charles Cory's name is indelibly associated with the faunal literature of the West Indies, beginning with his Birds of the Bahama Islands (1880) which had two printings, the last in 1890. The reader is referred to the Catalogue list for the complete roster of Dr. Cory's excellent monographs.

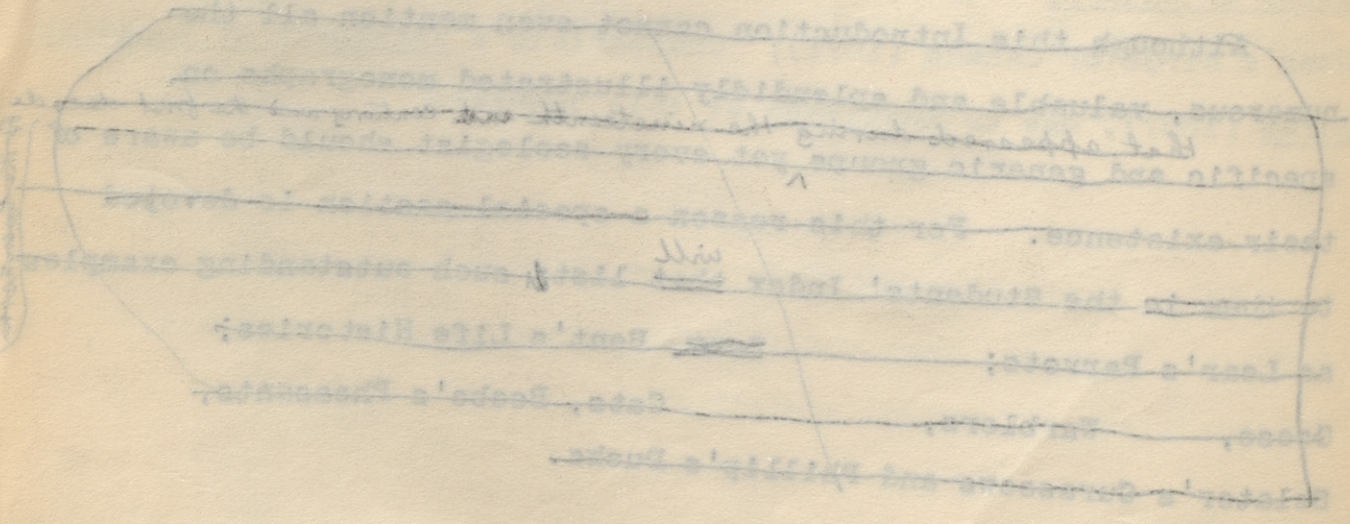
Cuba, Porto Rico and Haiti also claim a large number of authors - Lembeye, Poey and Gundlach among the early writers, Wetmore among the recent contributors.

Although Baron de la Hontan published a catalogue of the Canadian animals - birds in particular - in his Voyages (1793) and description and while figures of British American fauna form part of several noted treatises on North American zoology, yet Canada has not received the special attention that the importance and variety of her faunal species demand.

The adjective Canadensis has been rather overworked in systematic biology for many a long year, and the Dominion has not been neglected by zoological writers as part of North America, but local treatises are few. However, Thos. Nuttall's (1786-1859) Manual intwo volumes (1832-34) and one volume in 1840; McIlwraith's Birds of Ontario (1894); Taverner's Birds of Eastern Canada (1919); Ross's Birds of Canada (1871); Chamberlain's Catalogue of Canadian Birds (1887), may be mentioned at this juncture.

¶ In addition to the various editions of his Check List of North American Birds (Ist.ed., 1882) and of the famous Key to North American Birds (1872 ed. prin.), Elliot Coues was responsible for many works that did not bear his name as part of their major titles, among them Stearns's New England Bird Life in 2 volumes, 1881-83. ¶ Another and still more popular treatise is North American Birds (1874-84) by that versatile and accomplished trinity, Baird, Brewer and Ridgway. This work was followed in 1887 by a 2nd. edition, and in 1896 appeared a Manual of North American Birds by the last-named author. ¶ In 1892 was published Major Bendire's classic and finely illustrated Life Histories of North American Birds.

~~Although this Introduction cannot even mention all the numerous, valuable and splendidly illustrated monographs on specific and generic groups that appeared during the nineteenth century and the first decade yet every zoologist should be aware of their existence. For this reason a special section is devoted to them in the Students' Index will list such outstanding examples as Lear's Parrots; Bent's Life Histories; Geese, Warblers, Cats, Beebe's Pheasants, Sclater's Curassows and Phillip's Ducks.~~ ¶ Hachisuka's Gibbons



The Compiler is well aware that there exist in the literature of the nineteenth and early twentieth centuries many well-known, finely illustrated and important treatises devoted to individual ~~zoologic~~ vertebrate orders, families, genera and species. Perhaps the forty volumes of Jardine's encyclopedic Natural History furnish the best collection of this class. However, the present Introduction cannot, owing mainly to lack of space and to a desire to avoid needless repetition of titles, do more than mention a few of these monographs ~~that~~ Some of which have ~~not~~ already been quoted in this section. These titles with many others listed in the Student's Index and the Catalogue ~~are mostly ornithological and~~ comprise such works as Sclater's Curassows; Bent's Life Histories of North American Birds; Eyton's Anatidae, 1838; Hervieux's Canaries, 1730; Knip's Pigeons, 1808; Beebe's Pheasants, ; Finsch's Papageien, 1867-68; ~~Reichenow's Finches, 1878; Sharpe's~~ Lear's Parrots, 1832; Gould's many monographs, e.g. his Toucans, 1834; Kirke Swann's Accipitres, 1923— ; Brehm's Papageien 1842; Phillips' Ducks, 1922-; Miller's Bats, 1907; Forbes' Primates, 1894; Blaauw's Cranes, 1897; Alferaki's Geese, 1905; D.G.Elliot's Grouse, 1864; H. Allen's Bats of North America, 1864; Elliot's Felidae, 1883; E. Blyth's Cranes, 1881; Dewhurst's

Cetacea, 1834; Sclater and Smit's Antelopes, 1894-1900; Greene's Parrots, 1887; Eudes-Deslongchamps' Trochilides, 1881; [redacted], ; Thos. Beale's Sperm Whale, 1839; Seth-Smith's Parrakeets, ; Dresser's Meropidae, 1884; St. George Mivart's Cat, 1881; Widegran's Sveriges Salmonider, 1862; E. Coues Mustelidae, 1877; M.C.Engell's Elefantens udbred i Afrika, 1899; Lord Tavistock's popular work on Parrakeets, 1929; Fayrer's Snakes of India, 1874; Gould's Kangaroos, 1841; Lydekker's Cervidae, 1898; Herbert Friedmann's Cowbirds, 1929; Jardine's Felidae, 1845; Jardine's British Salmonidae, (1839); Russ's Brieftaube, 1877; Lydekker's Ruminants, 1898; Roosevelt's Deer Family, 1902; Beddard's Whales, 1900; Dugmore's Newfoundland Caribou, 1913; etc. Finally,

R. Lydekker's Handbook to the Marsupilia and Monotremata, 1894, and most of that versatile author's numerous other monographs will be found listed in the present Catalogue as good examples of original treatises.

The articles on paleontology contributed by Sir Richard Owen to the eighth edition of the Encyclopaedia Britannica, though now out-of-date, are among the best of the earlier essays on the geologic relations of extinct animals. This essay was followed (1877) by Researches on the Extinct Mammals of Australia and (1879) by a Memoir on the Extinct Wingless Birds of New Zealand and elsewhere, illustrated by an atlas with 128 plates.

The paleontologic works of vaious members of the Woodward family should be familiar to the research student. These monographs are many of them listed and evaluated in the present Catalogue.

The chapters on vertebrate zoology in C.G.Ehrenberg's Symbolae Physicae (1825-45) (which he wrote in conjunction with Hemprich) are well worth perusal.

Among the dictionaries and cyclopedias of natural history listed in the appended Catalogue is the immense Encyclopédie Methodique (1782-1832), 196 volumes, several of which are devoted to vertebrate zoology, most of it contributed by L.J.M.Daubenton, A.G.Desmarest and the Abbé Bonnaterre.

An excellent combination of the systematic and popular appeared in the manuals of the naturalist P.H.Gosse, whose Mammalia (1848); Birds (1849); Reptiles (1850), and Fishes (1851) are well worth perusal.

~~In 1849 appeared J.E.Gray's important Catalogue of the Snakes in the British Museum~~.

Wood. Redpath Museum

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Chapter XI.

Some Important Treatises and Monographs on Ornithology and Mammology published during the Nineteenth and Twentieth Centuries.

Caps

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A few forerunners of modern zoological Literature:— Merrett— Plot— Pennant— Sterkenhout— Tunstall— Swainson— J. Fleming— L. Jenyns— Thos. Bell— John Church—

Flower and Lydekker— Max Weber— W.K. Gregory— H.F. Osborn— W. F. Kirby— John Latham— Vieillot— R. Gray—

Typical British Faunists:

Gurney— Brown and Buckley— Sterland— Muirhead— Tucker— Knox— Partington— J. Atkinson— A.G. Butler— Eagle Clark— A. Lefèvre—

Typical Continental Zoologists:— Rzaczynski— Grossinger— J.L. Frisch— J.D. Peterson— J.B. Fischer— Beseke— Bechstein— J.A. Naumann— Borkhausen— Pilati— Cetti— Krozeman— Houttuyn— Linnaeus— Brunnich—

Chapter XI.

Gunnerus — France — Chenu — A. G. Desmarest — Temminck —

Brehm — Blasius — Great Britain — J. Walcott — Lord — Donovan —

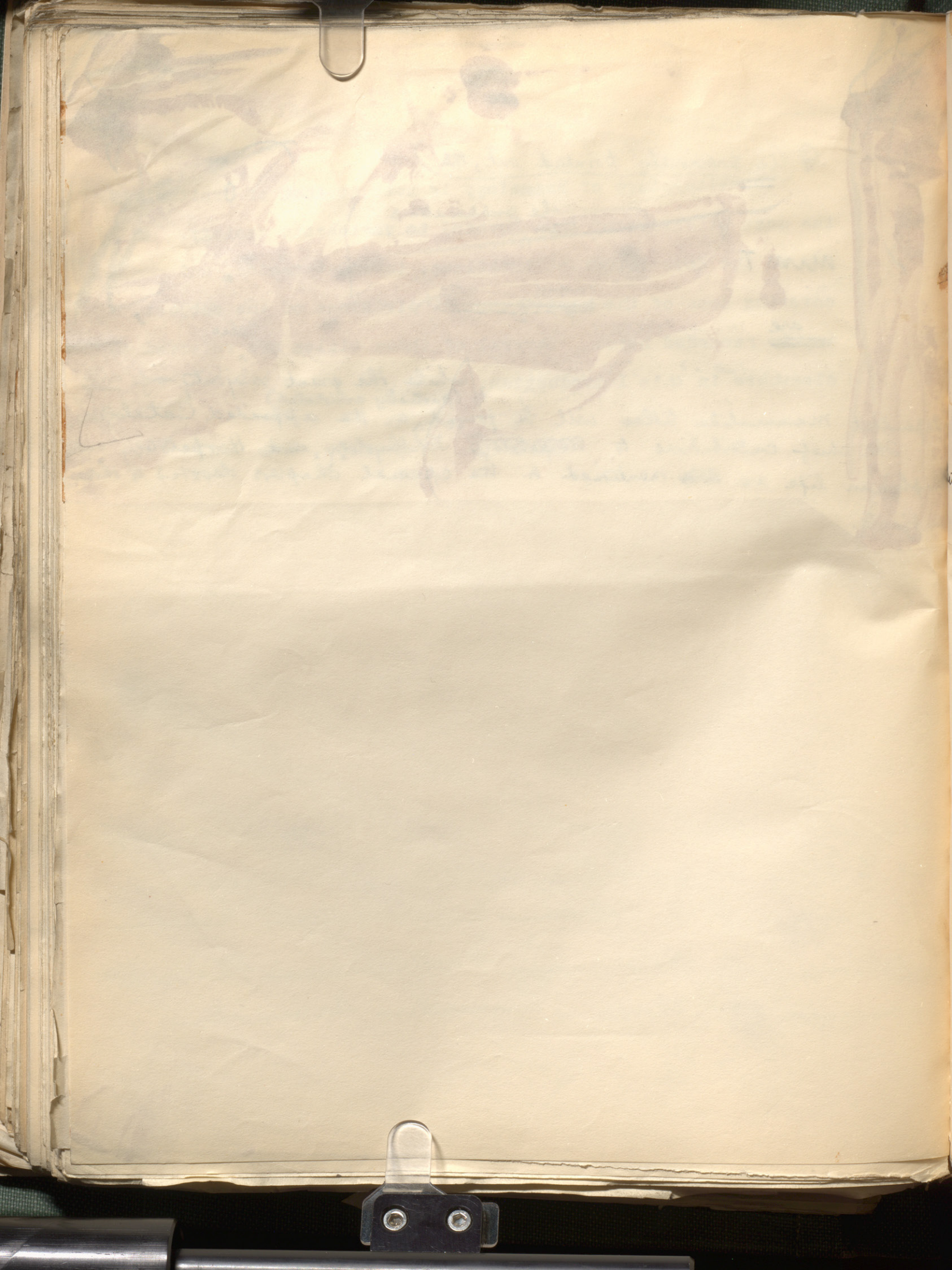
Bolton — Bewick — Gilbert White — G. R. Gray — America —

Pennant — Barton — J. R. Forster — Bertram — Wm. Yarrell —

J. G. Wood — J. Duncan.

¶ As previously pointed out, the literature of Mammalogy is next to that of Ornithology the most extensive of the publications devoted to vertebrate zoology. The more important treatises, taken at random, and covering some of the maius Subdivisions of the subject, are recorded here. Several of these titles are also referred to elsewhere in this Introduction, while the great majority of all (particles annotated) dependent mammalian titles will be found in the appended Catalogue.

The chief contributions to Ichthyology, Herpetology and phibian life are mentioned in the special chapters devoted to those ubjects.



¶ Every civilized country possesses a local literature on its zoological inhabitants, some of it extremely voluminous. Elsewhere the Compiler has listed a considerable number of these monographs, especially British and American, quite a few elaborately illustrated and describing minutely the animal life of limited areas. A brief account of a few such local faunists is desirable in a work of this kind, being given greater prominence. more extended treatises

¶ The government publications (reports, books, etc.) of Great Britain and Ireland issued by the various departments, offices, surveys, and numerous commissions of the Empire, now and then contain or are chiefly concerned, directly or indirectly, with vertebrate zoology. This is especially true of game and of fishes as food. The McGill libraries have a full complement of these works, and the Compiler refers the student also to the Cat. British Mus. (Nat. History) under the caption Great Britain and Ireland for a list of them. In the present Introduction only the most important can be noticed.

¶ As a prelude to the mention of modern ~~ornithological~~ publications on Aves and Mammalia a few forerunners of nineteenth and twentieth | literature may first of all be noted.
century

¶ Merrett's Pinex contains the earliest list (1666) of British Birds, while Plot's Natural History of Oxfordshire (1677) was the first of ~~that~~ a long line of local "faunographs" hardly one of which fails ~~neglects~~ to contribute something new to the zoology of the county or counties described. ~~Some of these make fresh and valuable additions to our knowledge of British animals; others are compilations or excerpts from perviously published works on zoology. They cannot all be mentioned here but with few exceptions these "local faunographs" are listed (with occasional notes) under their proper headings in this Catalogue.~~

An excellent treatise appeared ~~about this time~~ somewhat later - Pennant's British Zoology - a folio first issued in 1768, with several succeeding editions. Berkenhout published his Natural History of Great Britain and Ireland in 1769, after which, in time and interest, came Tunstall's (and Fothergill's) Ornithologia Britannica, folio, 1771.

Thomas Pennant was born at Downing, Flintshire June 14, 1726. In 1744 he went to Oxford but left without taking a degree. Between 1754 and 1774 he traveled extensively on the Continent and over the British Isles. From boyhood he had been greatly interested in natural history, was a friend of and correspondent of Linnaeus, and wrote extensively on zoologic subjects. He died Dec. 16, 1798.

The McGill Libraries, especially the Blacker collections, are rich in British titles in all departments of Vertebrate Zoology, among them are the important early works of Thomas Pennant (1726-1798), already referred to. The numerous editions of his Pennant's famous British Zoology, folio, 1766, was first published anonymously by the Cymmrodorion Society, followed in 1768-70 by a second and more complete 8vo, edition in 4 volumes, illustrated by plates.

In 1771 there appeared at Chester the first edition of his Synopsis of Quadrupeds which, like the preceding treatise, had several subsequent and amended editions and was translated into German. Later, accounts of the natural history of his voyages to Scotland, Wales and elsewhere, appeared in print, preceded by his well-known Genera of Birds, Edinburgh, 8vo., 1773; 2nd. ed., London, 1781. Of considerable interest to Americans are the two editions of his Arctic Zoology, the first one appearing in London, 2 vols., 1784-85, and a supplementary volume in 1787. A good review of the life and works of this important naturalist is that of Sir W. Jardine - a Memoir of Pennant - in the former's Humming Birds, Pt. II, 1833.

A valuable systematic treatise was W. Swainson's Treatise on the geography and classification of Animals, 1835.

Another observer of lesser rank than Pennant was John Fleming, who, however, wrote a fairly good Philosophy of Zoology, in 2 vols., Edin., 1822, giving his favorite classification of animals, followed by A History of British Animals, etc., 1828, reprinted in 1842. In 1835 Leonard Jenyns (afterwards Blomefield) brought out a Manual (followed by a Catalogue) of British Vertebrate Animals. This writer is, however, better known for his contributions to the Ichthyology of the "Beagle" expedition. Edward Forbes (1815-1854) although a specialist in mollusca contributed many papers on British biology in general, mostly in conjunction with other writers. A versatile author (editor of the Zoological Journal) was Thomas Bell (1792-1880). Among his numerous contributions to vertebrate literature of the British Isles is his History of British Quadrupeds, etc., 8vo., London, 1837, 2nd. ed., 1874, and a History of British Reptiles, etc., London, 1839, 2nd. ed., 1849.

¶ Among the curios of early British mammologic literature is John Church's Cabinet of Quadrupeds, 1794-1805, 2 folio vols., well illustrated with drawings by J. Ibbetson.

~~An early and important work is M. Tunstall's Ornithologia Britannica, folio, 1771.~~ by Birds

¶ Although not a recent publication, the Introduction to the Study of Mammals, 1891, by Flower and Lydekker, is of great value to the student; and the same may be said of Die Säugethiere, 1904, of Max Weber. Another instructive treatise is W.K. Gregory's Orders of Mammals, one of the Bulletins, Vol. XXVII, 1910, issued by the American Mus. Nat. History, New York. Of the many works on vertebrate paleontology, H.F.Osborn's Age of Mammals, 1910, is to be recommended.

A brief but systematic study of the general subject is W. F. Kirby's Mammals of the World, London, 1907.

Reference has several times been made to John Latham (1740-1837). His General Synopsis of Birds and their supplements, 1781-1802; his General History , 1821-28, with several editions (English and German) and his systematic treatise, or Index Ornithologicus (1790), are well known to instructed ornithologists, and form an essential part of all good libraries.

Mention has been made in this Introduction to the valuable contributions to ornithology of L.J.P.Vieillot (1748-1831). Among these is an Americana of considerable importance, his Histoire Naturelle des Oiseaux de l'Amerique septentrionale, in 2 vols., Paris, 1807.

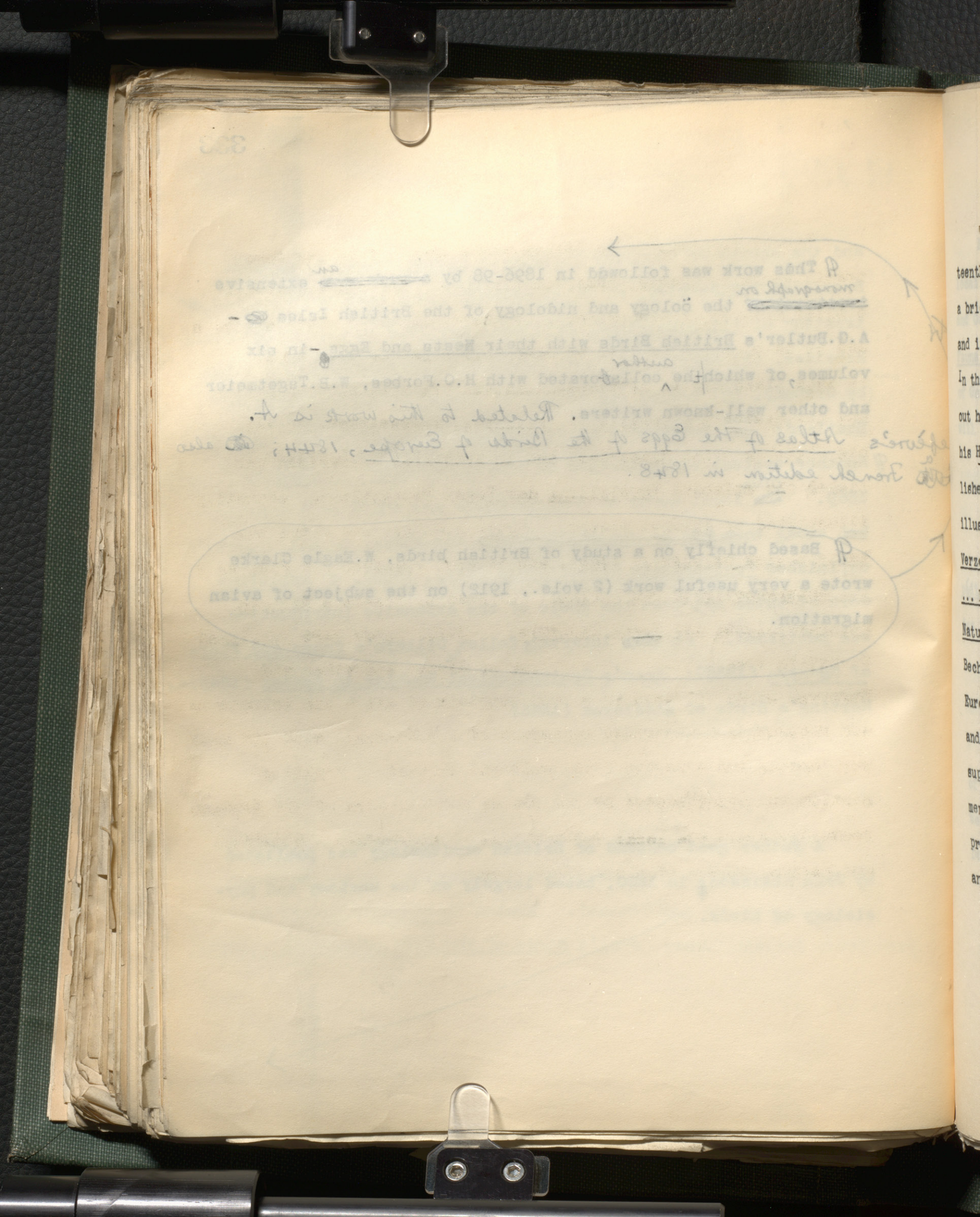
Probably no ~~fauna~~ *fauna* of the palaearctic region has been so thoroughly described in monographic literature as the ~~avifauna~~ *aves* of Great Britain and Ireland. Newton (Dictionary, pp. 44-45) notices, for North Britain, Robert Gray's Birds of the West of Scotland (1871),

and the series of district Vertebrate Faunas, begun by Harvie-Brown and T.E.Buckley, of which seven volumes have now appeared, treating of (1) Sutherland, Caithness and West Cromarty, (2) Outer Hebrides, (3) Argyll and Inner Hebrides, (4) Iona and Mull (this by Graham), (5) Orkney and (6 and 7) Moray, as well as Dee and Shetland; also Muirhead's Birds of Berwickshire (2 vols. 1889-96). Another typical local history is Sterland's Birds of Sherwood Forest, 1869. Other local works on English birds are still more numerous, among them the oldest of all, Tucker's unfinished Ornithologia Danmoniensis (4to, 1809), an ambitious work of which not even the whole of the extensive Introduction was published. At intervals followed Dillwyn's Fauna and Flora of Swansea (1848); Knox's Ornithological Rambles in Sussex (1849) and Harting's Birds of Middlesex (1866)

A rather good compend of British ornithology was published by John Atkinson in 1820, based largely on the anatomy and physiology of birds.

¶ This work was followed in 1896-98 by ~~a much more~~ an extensive ~~monograph on~~ the öology and nidology of the British Isles - A.G.Butler's British Birds with their Nests and Eggs, - in six volumes, of which the author collaborated with H.O.Forbes, W.B.Tegetmeier and other well-known writers. Related to this work is A. Lefèvre's Atlas of the Eggs of the Birds of Europe, 1844; also a French edition in 1848.

¶ Based chiefly on a study of British birds, W.Eagle Clarke wrote a very useful work (2 vols., 1912) on the subject of avian migration.



"Local faunists" - as Newton calls them - from the seventeenth century onwards present a difficulty for one who essays a brief history of zoological literature in all countries, since their name is legion, and it is possible to list by name only a few of them. In this place it may be mentioned that in 1721 Rzacznski brought out his Historia naturalis ... Poloniae; Grossinger, in 1793, his Historia avium Hungariae. In 1743-1763 J.L.Frisch published the splendid Vorstellung der Vögel Teutschlands, admirably illustrated by colored plates. Later, J.D.Peterson wrote his Verzeichness baltischer Vögel, and in 1791 appeared J.B.Fischer's ... Naturgeschichte von Livland, followed by Beseke's Beytrag z. Naturgeschichte der Vögel Kurlands. Still later were published Bechstein's well-known descriptions of German and other mid-European birds followed by - most complete of all - the voluminous and remarkably illustrated monograph of J.A.Naumann on Central European ornithology, with its many supplements and a recent fine, enlarged edition. Worthy of mention but overshadowed by the beauty and fullness of the Naumann productions are the local publications of Borkhausen (1800-1841) and several others of minor importance.

During this period appeared also many treatises by other local naturalists, among them (for Italy) Pilati, Gilius, Bernini and Cetti; (Holland) Nozeman and Houttuyn; (Scandinavia) Linnaeus' Fauna Svecica; Brunnich's Ornithologia borealis, and the writings of Gunnerus and Otho Fabricius, most of whose annotated titles will be found in the present Catalogue.

In France there appeared (1850-80) Chenu's valuable Encyclopédie d'Histoire Naturelle in the preparation of which Desmarest, des Murs and other well-known writers participated.

Here may also be noted the work (8 vols. and 4 vols. atlas) of L.P.J.Vieillot's Faune Française, 1820-30, of which the birds were described by the author, mammals and reptiles by A.G. Desmarest, and the fishes by H.M.D. de Blainville.

An early and very useful work of reference dealing with European avifauna is Temminck's Manuel d'Ornithologie, published in 1815 and 1820.

Of the comparatively early work on the Birds of Europe, the treatise of John Gould (1832-37) was sumptuously illustrated by his usual profusion of finely executed hand-colored plates.

In 1831 Brehm issued his Naturgeschichte der Vögel Deutschlands, ~~etc.~~. really a handbook of the birds of North and Middle Europe. However, the most complete treatise on Middle European bird-life is an enlarged edition, published in 1860 and edited by Blasius, of Naumann's ~~celebrated~~ original Naturgeschichte der Vögel Deutschlands, 1795-1803.

In 1789 appeared John Walcott's Synopsis of British Birds; Wm. Lewin's (Superior) Birds of Great Britain in 7 volumes; Lord's (inferior) System of Ornithology and Donovan's voluminous Histories of Animal Life in the British Isles, followed by Bolton's very popular Harmonia Ruralis. ¶ Bewick's Histories are better known for their remarkable woodcut illustrations than for the scientific value of the text. Most of this last-named naturalist's titles will be found in the present Catalogue. ← Here insert XXX →

Thomas Bewick was born at Ovingham, Northumberland, in 1753, the son of a farmer. He early evinced a love of nature and of drawing. When fourteen years of age he was apprenticed to the Newcastle engraver Beilby, whose partner he subsequently became. From 1779 onwards he produced woodcuts as illustrations for many books, his figures and tailpieces showing an immense advance over previous examples of wood engraving. He died in 1828, having acquired a reputation as the most effective, accurate and spirited wood engraver of his day.

of fact or opinion it contains recommend it alike to [illegible] of readers. The first issue was in 1789, and since that date there have been published more editions and imitations of this fascinating book than of any other work on natural history in the wide

In 1789 appeared John Walcott's Synopsis of British Birds; Wm. Lewin's (Superior) Birds of Great Britain in 7 volumes; Lord's (inferior) System of Ornithology and Donovan's voluminous Histories of Animal Life in the British Isles, followed by Bolton's very popular Harmonia Ruralis. ¶ Bewick's Histories are better known for their remarkable woodcut illustrations than for the scientific value of the text. Most of this last-named naturalist's titles will be found in the present Catalogue. ← Here insert xxx →

¶ While these pretentious and in many instances truly valuable contributions to scientific zoology were being published in Great Britain a small volume by an obscure clergyman named Gilbert White appeared, with the title The Natural History of Selborne, from the little village in which he lived. It consists mostly of letters to scientific friends and, as Newton says "the graceful simplicity of its style, the elevating tone of its spirit and the few errors of fact or opinion it contains" recommend it alike to all classes of readers. The first issue was in 1789, and since that date there have been published more editions and imitations of this fascinating book than of any other work on natural history in the wide

world. There are few zoologists that have not fallen under the charming influence of its delightful pages. About thirty of the chief printings, including the first, are listed in the present Catalogue.

In 1817 John Walcott issued his 3-volume Exotic Animals, comprising descriptions of the Linnaean classes of Fishes and Amphibia and illustrated by 60 plates.

The works of George Robert Gray mark an important era in zoological literature. For many years in charge of the ornithological collections of the British Museum, he began by publishing an important List of the Genera of Birds in 1840, followed by a second edition in 1841. The E.S.W.Library has both these editions, the later one being Gray's interleaved own copy with MS. notes for use in succeeding treatises.

In 1844-49 appeared his famous Genera of Birds in three folio volumes, beautifully illustrated by Mitchell and Wolf with 185 hand-colored and 148 uncolored plates. It registers referances to more than 2400 generic names and forms an indispensable item in every research library on zoology.

The foregoing were privately printed, but in 1855 Gray brought out for the Museum his well-known Catalogue of the Genera and Subgenera of Birds, a small but useful manual of his larger works.

(p.c.) Dr. Charles Richmond, in a private letter to Mr.W.L.Sclater, points out that the Carnegie Museum has appended to its library copy of the 1855 Catalogue an additional title-page reading "A List of Genera and Subgenera of Birds, 1855, printed by Taylor and Francis", followed by a leaf of "Addenda" printed on both sides. Dr. Richmond thinks this appendix is not a part of the British Museum publication but was added in a few instances to presentation copies. In any event the leaflets are exceedingly scarce.

In 1869-71 Gray published for the Museum his Hand-List of Genera and Species of Birds in three parts, making three octavo volumes, thus adding more valuable tools to the armament of the research student.

In the meantime the fauna literature of North America was not neglected. Pennant's Arctic Zoology, Barton's Fragments, J.R.Forster's Catalogue and Bartram's Travels furnished a fair and early account of animal life then known to exist in the northern latitudes of the New World.

As elsewhere mentioned, oology is not made a special study in this Introduction, but Wolley's Ootheca Wolleyana, 1864, 1902 may be regarded as an exception to this rule of partial exclusion.

A voluminous as well as scientific and popular writer on British zoology is Wm. Yarrell (1784-1856). His chief treatises are a History of British Fishes; ~~[illegible], London, 1835-36, followed by two subsequent editions, in 1841 and 1859, and~~ also A History of British Birds, 3 vols., ill., 8vo., London, 1837-43, that appeared in four 4 editions, the last one, in 4 volumes, revised and enlarged by Alfred Newton and H. Saunders, 1871-1885. These two works form an important part of English zoological literature.

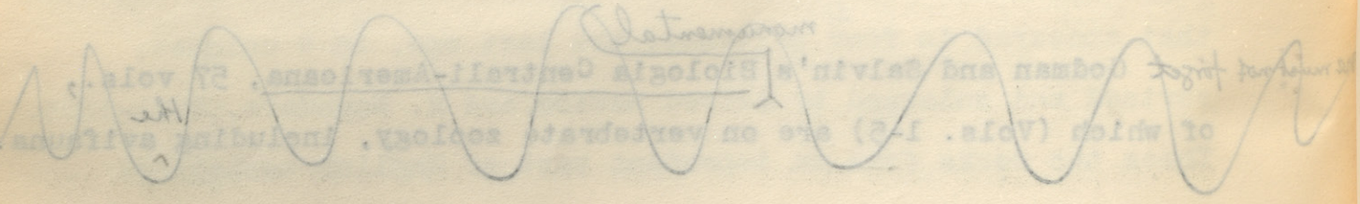
Popular forms of literature on vertebrate zoology have their uses and although the Compiler does not intend to evaluate many of them a few will be mentioned. Among (the) ~~such~~ writers of such books is the Rev. John G. Wood (1827-1899), whose Illustrated Natural History and Feathered Friends, 1856, each in several editions, have been widely read. ~~very popular.~~ ¶ A semi-popular work is John Duncan's Birds of the British Isles, ~~[illegible]~~ 1898.

Another "local faunist" is W.P.Turnbull, whose Birds of East Pennsylvania and New Jersey was privately printed and published (1869) at Glasgow. His other ornithological works (q.v.) were issued in America. A another and valuable monograph on local avifauna is A. H. Howell's Birds of Arkansas, issued in 1911.

Still another local work is E.H.Eaton's Birds of New York, 2 vols., the first part of which appeared in 1910.

We must not forget Godman and Salvin's monumental Biologia Centrali-Americana, 57 vols., of which (Vols. 1-5) are on vertebrate zoology, including the avifauna.

A very readable account of the natural history of Canada is given by W.R.King in his Sportsman, etc. 1866.



In 1906 A.P.Low reported on the Birds of Hudson's Bay and the Canadian Arctic Islands.

Attention may here be drawn to the recent, revised and partly rewritten edition of Frank M. Chapman's excellent Handbook of the Birds of Eastern North America, 1927.

H. Kirke Swann contributed (1895) brief but interesting observations of the fauna of Nova Scotia in his Nature in Acadia.

A Returning to the vertebrate-zoological literature of the Old World,

a comprehensive study of the fauna of the Netherlands is H. Schlegel's Natuurlijke historie van Nederland (1860-78) in 6 volumes, illustrated by numerous colored plates, depicting and describing not only the mammalia but the birds, fishes and reptiles.

Of considerable value to the advanced student is J. Herman Albarda's list of Holland birds in his Aves Neerlandicae, 1897.

An interesting, popular work on the Flora and Fauna of Palestine was published by H.C.Hart in 1891.

An account, largely ornithologic, was given of Asiatic birds by Pallas (1811, St. Petersburg), in his Zoögraphiæa Russo-Asiatic.

J. Gould and B. Sharpe published beautifully illustrated volumes (London, 1888) on the Birds of Asia, preceded (in 1831) by a Century of Himalayan Birds from the pen of the former zoologist.

Count Salvadori described many Oceanic add South Asian birds in his Ornithologia della Papuasia, 1880-91.

The Birds of China were largely described by David and Oustalet under the title Les Oiseaux de la Chine, Paris, 1877.

~~Capt. Legge's classic, the Birds of Ceylon, London, was published in parts, the first issued in 1880.~~

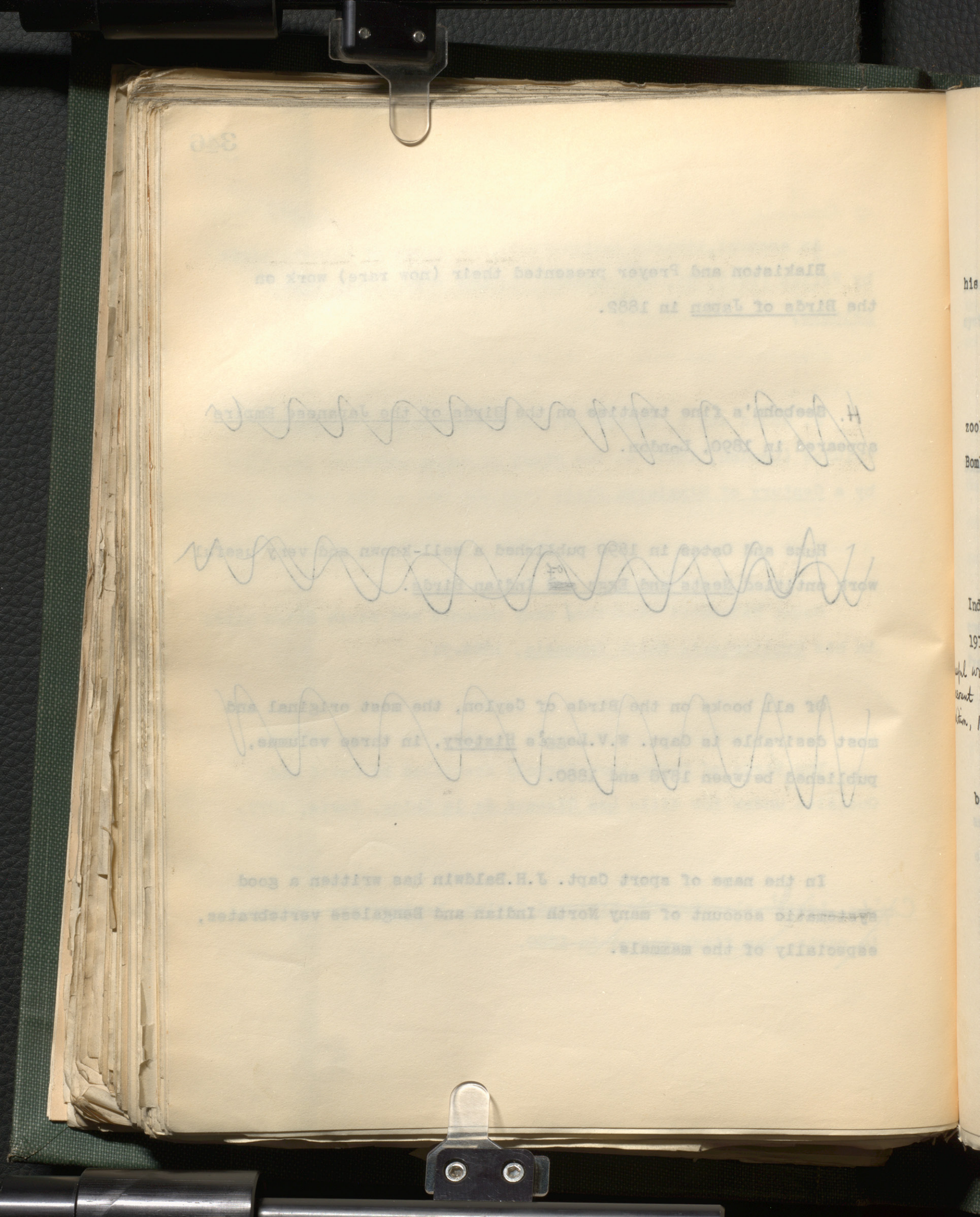
Blakiston and Preyer presented their (now rare) work on the Birds of Japan in 1882.

H. Seebohm's fine treatise on the Birds of the Japanese Empire appeared in 1890, London.

Hume and Oates in 1890 published a well-known and very useful work entitled Nests and Eggs of Indian Birds.

Of all books on the Birds of Ceylon, the most original and most desirable is Capt. W.V.Legge's History, in three volumes, published between 1878 and 1880.

In the name of sport Capt. J.H.Baldwin has written a good systematic account of many North Indian and Bengalese vertebrates, especially of the mammals.



In 1901 appeared Seebohm's Birds of Asia, in which he reports his practical experiences of the avifauna of that continent.

J.A.Murray's contributions to the literature of Indian zoology are well-known, especially his Vertebrate Zoology of Sind, Bombay, 1884, and his Avifauna of British India, 1887.

Adding to his several contributions to the ornithology of India, Stuart Baker wrote in 1908 his Indian Ducks followed in 1913 by Indian Pigeons and Doves, London and Bombay.

A useful work, combining systematic treatment of the subject with a popular account is T.C. Jerdon's Mammals of India, especially the second edition, 1874.

In 1913 appeared (London) Dewar's interesting and popular book, Glimpses of Indian Birds.

George Reid published in 1890 his Birds of the Indian N.W. Provinces.

Bucknil and Chasen's Birds of the Islands of Singapore, 31 col. pl., was published in 1927, and is a popular and useful systematic account of the avifauna.

The mammals of Malaysia have been well described by J.L. Bonhote in Fasciculi Malayenses, 1903.

H. Schlegel's Birds of the Dutch East-Indies (1863), a comprehensive history in three volumes, was published in both French and Dutch.

For Wichmann's classic Nova Guinea, 1906, E.D.van Oort wrote an account of the birds, other well-known naturalists treating the other vertebrates collected during the expedition.

One of the most acute of observers of the Zoology of Java was, as already mentioned, Thos. Horsfield, the titles of whose works on the subject are to be found in the appended Catalogue.

Of the early works dealing with the vertebrate zoology of Japan the best is P.F.Siebold's Fauna Japonica, 6 vols., 1833-50, complete sets of which are quite rare. C.J.Temminck and others assisted in the preparation of this elaborate monograph.

H. Seebohm wrote an important and, at the time, much needed volume on the Birds of the Japanese Empire, in 1890.

¶ The literature of the vertebrate Zoology of Africa and the neighboring islands is quite extensive.

¶ In 1884 Milne-Edwards and others brought out at Paris a Histoire naturelle des Oiseaux de Madagascar, both the birds and mammals of that island having been previously described (1875) by Edwards and Grandidier.

The vertebrate zoology ~~of~~ Sir Andrew Smith's South Africa, (1849), 5 vols., is very important.

Starke and Sclater published (1900-1906) the avian portion of the Fauna of South Africa, in four volumes, London - a comprehensive and scientific production. ¶ Also a useful four-volume treatise, well illustrated and semi-popular, is F. W. Fitzsimons' Natural History of South Africa, 1919-20, in which the Mammals are systematically described.

¶ E.L.Layard's Birds of South Africa have deservedly reached several editions, that of 1875-84 having been revised by Bowdler Sharpe.

Captain Shelley's last contribution to the subject was published in 1896-1913, a complete and valuable work entitled the Birds of Africa.

¶ An interesting monograph on the mummified fauna of ancient Egypt was issued by the Cairo Museum from the pens of Gaillard and Daressy, 1905.

In 1901 H.E.Harris published a series of photographs and essays on Some Birds of the Canary Islands and Africa, illustrated by 56 plates and numerous cuts in the text.

J.I.S.Whitaker in 1905 wrote a useful, systematic work on the Birds of Tunisia.

In 1912 there appeared in London, Game Birds and Water Fowl of South Africa, by Horsburgh.

L.J.Schultze's Zoologische Ergebnisse (1908-13) furnishes systematic descriptions of the vertebrates of West and Central South Africa.

A recent and most excellent systematic treatise (though poorly illustrated) on the Birds of South Africa is the Handbook of G.L.Bates.

Chapter XII. 12pt caps #d

II. Some Important Treatises and Monographs on Ornithology and Mammalogy published during the Nineteenth and Twentieth Centuries, Continued.

Cap 12pt ital. caps

More British Local Faunists:—

~~W. Brooke~~ J. Duncan — Jonathan Couch — Wm Evans — Wm Thompson — Cecil Smith — Hancock — Christy — Borrer — Willis Bund — Pidsley — H. A. Macpherson — Whitlock — Kirke Swann — Lord Lilford — H. E. Dresser — D. G. Elliot — Arrigoni degli Oddi — Temminck — Borowski — Wytsam — Schulze — P. L. Sclater — W. L. Sclater — Pechuel-[hyphen]Loesche — von Schreber — F. O. Morris — P. Westell — H. W. Wharton — Wm Macgillivray — G. R. Waterhouse — S. G. Miller — C. J. Cornish — Bree — A. Lindermayer — Brodrick — H. Schlegel — Gadeau de Kerville — R. B. Sharpe — Fauna of Africa — G. E. Shelley — E. Whymper — Barbozo du Bocage — C. J. Hartlaub — W. C. Harris — Finsch and Hartlaub — Anderson — Heughlin — Layard — A. Grandidier — W. H. Drummond — G. Révoil — Schilling — R. E. Drake-[hyphen]Brockman — V. A. Peel — ~~Dr. Bree~~ (Alex. Wilson — Audubon — ~~Gen.~~ Elliott Coues — American Zoologists: — Chas. Chubb — Lord (Prince ~~Lucien~~ Bonaparte — S. F. Baird — Joseph Henry — Brabourne — Crawshay — Taczanowski — Baron Tschudi — Azara — Mikan — A. Pelzeln — G. L. Bates — G. N. Lawrence —

Marsh — Richard Harlan — ~~J.~~ H. Studer — C. J. Maynard —
T. Jasper — A. E. Verrill — F. Kermode — W. A. Bryan —
Jones Family — Geo. Ord — Kumlein — Turner — Belt —
Sclater and Hudson — Chas. Cory — Warren — D. G. Elliot —
C. H. Eigenmann — C. M. Scammon — A. Pope — W. P. Turnbull —
E. H. Eaton — W. R. King — A. P. Low — Kirke Swann — H. C. Hart —
Pallas — Count Salvadori — David and Oustalet — Blakiston
and Preyer — J. H. Baldwin — Zoology of Asia — Seebohm — J. A. Murray —
Stuart Baker — Jerdon — Dewar — Geo. Reid —
[illegible]cknil and Chasen — J. L. Bonhote — H. Schlegel — E. D. Van Oort —
Literature of African ~~Zoologists~~ Zoology —
[illegible]. Horsfield — P. F. Siebold — Milne Edwards — Andrew Smith —
[illegible]tarpe and Sclater — F. W. Fitzsimons — E. L. Layard — Shelley —
Gaillard and Daressy — H. E. Harris — Whitaker — Horsburgh —
L. J. Schultze — G. L. Bates. All

Attention has several times been directed to the extensive and, in many instances, overlapping histories of local British Zoology, ~~only a portion of which can have mention in this place; most of them, however, are listed in the accompanying Catalogue.~~ Of these, the works of the Couch family on the zoology of Cornwall is a good example. Jonathan Couch (1789-1870) wrote an interesting Cornish Fauna, Truro, 1838-44, in which R. Quiller Couch described the zoophytes. The same author extended his observations and, in 1862-65, published a very creditable History of the Fishes of the British Islands, 8vo., London. The Blacker Library has several Jonathan Couch manuscripts.

The mammology of Scotland, Edinburgh region, is systematically discussed by Wm Evans in his Mammalian Fauna, 1892.

~~Again, attention is drawn to the~~ noteworthy treatise of H.E.Dresser, ~~on Birds~~ of Europe, 1902-05, and to his Eggs of the Birds of ~~Europe, in 2 volumes, 1905-10~~.

¶ In this list of local treatises may be included William Thompson's (1805-52) Report on the Fauna of Ireland, 2 pts., 1841-44, followed by his Natural History of Ireland, in 4 vols., 1849-56, which, owing to the premature death of the writer, was completed by others. To these we add Stevenson's Birds of Norfolk (3 vols., 1866-90, completed by Southwell); Cecil Smith's Birds of Somerset (1869) and of Guernsey (1879); Cordeaux's Birds of the Humber District (1872); Hancock's Birds of Northumberland and Durham (1874); The Birds of Nottinghamshire by Sterland and Whitaker (1879); Rodd's Birds of Cornwall, edited by Harting(1880); the Vertebrate Fauna of Yorkshire (1881), in which the Birds are by W.E.Clarke; Churchill Babington's Birds of Suffolk (1884-86); A.C.Smith's Birds of Wiltshire(1887); Birds of Essex (1890) by Christy; of Sussex (1891) by Borrer and of Worcestershire (1891) by Willis Bund; ~~Buckley and Harvie-Brown's Vertebrate Fauna of the Orkneys, Sutherland, etc.~~ To the foregoing may be added the Birds of Devonshire (1891) by Pidsley, and (1892) by D'Urban and Mathew (Suppl. and ed.2, 1895); Lakeland (1892) by H.A.Macpherson; Lancashire (ed.2, 1893) by F.S.Mitchell; London (1893) by K. Swann; Derbyshire (1893) by Whitlock, and finally of Northamptonshire (2 vols., 1895) by Lord Lilford.

Of course the Victoria County Natural History, recently published, constitutes by far the most complete account of the local flora and fauna of England. ~~These monographs are listed in the Catalogue~~.

Attention is again directed to H. E. ~~Dresser~~ Dresser's Birds of Europe, 1902-3, 8 vols., fine colored plates, as well as to his Eggs of the Birds of Europe, 1905-10.

¶ A cosmopolitan writer and versatile systematist, with whom every advanced student of zoology should become acquainted, is Daniel Giraud Elliot, many times quoted in these pages. At this time reference is made especially to his well-known List of Land and Sea Mammals of North America, 1901, published by the (Chicago) Field Museum of Natural History, followed by 4 similar monographs on the same fauna in Middle America and the West Indies, 1904-17. His fine 4to, Review of the Primates, in 3 ill. vols., was published by the (N.Y.) American Museum of Natural History, 1912-13. Practically all Elliot's works are shelved in the Blacker Library of McGill University.

The Compiler wishes again to draw the attention of the student of vertebrate zoology to the great scientific and educational value of the many Guides to the immense collctions in the British Museum of Natural History, most of which are listed in the appended Catalogue. ~~As an example, the Guide to the Gallery of Reptiles and Amphibia, by R. Lydekker, pp. 4 + 75, 9 pls., illustrated text.~~

A very good atlas, with excellent descriptive letter press, of the Birds of Europe, has been published in Italian by E. Arrigoni degli Oddi, 1902.

Among well-known European zoologists stands the Hollander, Conraad Jacob Temminck, several times mentioned in this Introduction, who not only wrote many treatises on ornithology but published (alone and with others) several works on mammology and vertebrates in general. ~~On the former subject~~ He issued in 1827-41 his important Monographies de Mammologie, in two volumes, based on an examination of the collections in various European Museums.

Half a century earlier G.H.Borowski wrote and published his Gemeinnützige Naturgeschichte des Theirreichs, etc., in five volumes, with colored illustrations, dealing mostly with vertebrates.

An excellent example of specific and generic catalogues is the one recently issued by P.A.G.Wytsam. In this Genera Avium (1905 to date) each family is treated by a different writer, who is specially fitted to describe it.

A comprehensive work on general Zoology, Das Tierreich, was begun in 1896, in the editorial charge of F. E. Schulze, Berlin and published in Berlin by the Deutsche Zoolog. Gesellschaft.

Reference has several times been made to that talented and versatile zoologist, Philip Lutley Sclater (1829-1907?), whose contributions to zoologic literature are fully represented in the appended Catalogue. He wrote many monographs, especially on bird families, orders and species and (mostly in conjunction with others) numerous systematic treatises of great importance. Of his best known works one remembers the Birds of the Challenger Voyage, 1880; Catalogue of the Birds in the British Museum, 1886-91; (with W.H.Hudson) Argentine Ornithology, 1888-89, and (with O. Salvin) Exotic Ornithology, showing 100 colored plates of American birds. A bibliography of the elder Sclater's writing was published as Bulletin 49 of the United States National Museum, 1896.

Following in his famous father's footsteps, William Lutley Sclater (1863—), formerly Director of the South African Museum, published as Editor his first large work, the important Fauna of South Africa, 1900-06. This treatise shortly followed by others of equal value to vertebrate zoologists, e.g. A History of the Birds of Colorado, 1912; the Geography of Mammals (in conjunction with P.L.Sclater) 1899; all of which are listed in the accompanying Catalogue.

Of recent treatises on vertebrate zoology ~~in the modern sense~~ there is an abundant supply in all the European languages, one of the best being Pechuel-Loesche's (third) edition (1890-93) of A.E. Brehm's Illustrirtes Theirleben in ten[10] illustrated volumes, a work to which attention has already been directed.

¶ An excellent publication of a somewhat earlier period is the ~~somewhat earlier zoological period~~ abundantly pictured ~~and described~~ J.C.D. von Schreber's quarto, Die Säugethiere in Abbildungen ... mit Beschreibungen (1815-55) with over 300 colored plates and corresponding letter-press.

Of nineteenth century writers on British fauna one of the most popular was Francis O. Morris (1810-1893). His 8vo. History of British Birds in six volumes (1851-57) was several times reprinted, as was also his Natural History of the Nests and Eggs of British Birds, 3 vols., 1853-56.

¶ A popular little work by W. P. Westell on British Mammals appeared in (?) 1927 as one of the Abbey Nature Books.

H.W.Wharton (1846-1895) drew up a List of British Birds (1877), the genera arranged after Sundevall's method, the nomenclature revised by himself.

Several of Jas. E. Harting's numerous contributions to the literature of ornithology have been mentioned. Perhaps his Handbook of British Birds, second edition, 1901, was his best, and one should remember his essays on mammalian life, especially his Extinct British Animals, 1880. He was also our best modern authority on falconry and has written many books regarding this form of the chase (modern and medieval) that elegant and aristocratic sport of torturing and killing birds by means of birds.

Attention is again drawn to William Macgillivray's labors and writings lest one forgets that while he was a great ornithologist his investigations included the domains of geology, botany and mammology as well. In addition to his classic treatises on British Birds (1837-52) and his contributions to the (1831-39) Audubon series (q.v.) he wrote British Quadrupeds (1845-46) for the Naturalists' Library.

A little known treatise is a rather good Natural History of the Mammalia, in two illustrated volumes by G.R.Waterhouse, 1846-48.

The mammals of Western Europe (except Russia) are well described by S.G.Miller, 1912.

Of the many collections of chapters on zoology by different authors, brought together for the information of the lay reader, one may here mention C.J.Cornish's excellent Living Animals of the World (1901), of which several editions and translations have appeared.

In 1871 Fritsch wrote and published in Berlin Die Vögel der paläarktischen Fauna.

Many authorities regard Dresser's eight-volume treatise, the Birds of Europe, 4to., London, with many colored plates, as the most complete and informative work ever issued on the wubject in question.

In 1875-76 there also appeared Bree's History of the Birds of Europe, London.

Another excellent and recent account of European birds is Hartert's (1903-14) Die Vögel d. Paläartiktischen Fauna, Berlin.

Not many writers have touched the fauna of modern Greece. An exception is Ant. Lindermayer, who wrote in 1860 his Vögel Griechenlands.

Of the numerous array of monographs on the bird-life of the British Isles only a comparatively small number need be noted here. The best review of the whole subject to 1890 is found in the Introduction to Newton's Dictionary of Birds.

~~As before mentioned, a very valuable and original History of British Birds was issued in London by F.O.Morris; also~~ Highly spoken of is Seebohm's (1883-85) History of British Birds and their Eggs.

~~There are several editions of Yarrell's well-known History of Birds, one of the best being dated London, 1858.~~

Of the several modern works on British falconry one may mention at this time Wm. Brodrick's Falconer's Favorites, folio, 1865, and, in conjunction with F.H.Salvin, Falconry in the British Islands, 2nd. ed., 1873.

A second edition of that valuable work, H. Schlegel's De Vogels van Nederland, 2 vols., was published in 1878.

A quite complete account of the fauna of (old) Hungary is listed in the appended Catalogue under Budapest. Fauna Regni Hungariae, 1900.

In 1888-97 Gadeaux de Kerville wrote, in four fascicles, his excellent Faune de la Normandie.

The name of that celebrated British naturalist, Richard Bowdler Sharpe (1847-1909), occurs frequently in these pages. His first independent work was a Monograph of the Alcedinidae: or family of Kingfishes, 1868-71, with 126 beautifully colored plates by Keulemans. For nearly half a century he occupied a foremost position in the zoological world, publishing chiefly works on ornithology, many of them in conjunction with other writers. His principal treatises are in the McGill libraries and listed in the appended Catalogue.

¶ The vertebrate zoology of Africa has been the subject of many interesting publications. Mention of some of these has elsewhere been made in this Introduction

¶ Among works generally regarded as standard reference treatises are G.E.Shelley's Handbook to the Birds of Egypt (1872) and his larger Birds of Africa, completed and edited by W.L.Sclater, 1896-1912.

Chas. Whymper, also, wrote on Egyptian Birds (1909), mostly those seen in the Nile Valley.

Barbazo du Bocage has furnished an excellent account (1857-82) of the vertebrate zoology of Angola and other Portuguese possessions in Central and West Africa.

One of the excellent (rather early) works on African birds is C.J.J.Hartlaub's System der Ornithologie West-Afrikas, Bremen, 1857. Elsewhere allusion has also been made to his study of Madagascan fauna and other essays on African bird life, all listed in the Catalogue herewith. A still earlier work (1840) on Game and Wild Animals of Southern Africa, with 40 colored plates, was issued by W.C.Harris.

In 1870 (Leipzig), appeared Finsch and Hartlaub's Vögel Ostafrikas, a companion to the latter's 1857 treatise on West African avifauna.

~~Shelley, London, 1872, issued a very well known Handbook to the Birds of Egypt.~~

Anderson published (London, 1872) his Notes on the Birds of Damaraland.

During 1875 there appeared at Cassel Heughlin's Ornithologie Nordostafrikas.

An unusually good treatise, the second edition of which appeared in 1884, was Layard's Birds of South Africa, a text-book of great value to the systematic student.

A noteworthy cyclopedia, ~~monograph,~~ the Histoire physique de Madagascar of A. Grandidier, 1875-1920, in more than 40 vols., it's still unfinished. The whole range of zoology is fully treated in this monumental work.

In 1875 W.H.Drummond wrote a very readable Large Game and Natural history of South and South-east Africa, and, later, an interesting record of the natural history explorations of a traveler appeared in 1888, entitled Tropical Africa.

The fauna of Somaliland are described in George Révoil's Faune et Flore des Pays Comalis, 1882.

The fauna of Equatorial East Africa is partly described in Schillings' Mit Blitzlicht und Büchse, 1905.

Later (1910) R.E.Drake-Brockman wrote his well-known Mammals of Somaliland.

Of great interest for zoologists is C.V.A.Peel's Somaliland (1900) which gives a good account of the fauna (including the reptiles) of East Central Africa.

Among the "local faunists" that have written about South America is Charles Chubb (1851-1926) who with Lord Brabourne began what (owing to the untimely death of both authors) was unfortunately never finished, a complete account of the avian life of that continent. All that appeared is the Birds of British Guiana, 1916.

In 1907, R. Crawshay wrote his Birds of Tierra del Fuego, describing most of the species found on the islands and mainland in the region of the Straits of Magellan.

In 1884-86 Taczanowski (1819-99) published at Rennas, France, his Ornithologie du Perou, a voluminous treatise in ~~four~~ 4 volumes.

In his Fauna Peruana, 1844-46, Baron Tschudi described the birds (with J. Cabanis), fishes and reptiles.

A good description of many South American birds is to be found in Azara's (1805) Histor. nat. de los pajaras del Paraguay, Madrid.

In 1820 Mikan issued in four parts, with 24 colored plates, his classic Delectus Florae et Faunae Brasiliensis. A much later work on the birds of Brazil is that of A. Pelzeln, published in 1871.

For a study of Brazilian mammals, see Brazil. Commissão de Linhas Telegraphicas, 1914-16.

A classic travelogue that passed through several editions and translations is Bates' Naturalist on the River Amazons, (1863, London). In it bird-life plays a prominent part.

The birds of South-Western Mexico were described by G.N. Lawrence, in a report based on the collection made in 1875 for the United States National Museum by F.E. Sumichrast (1828-1882).

One cannot mention too often that remarkable series, Biologia Centrali-Americana, in which (1880) P. L. Sclater described the avifauna.

In 1880 Marsh brought out his well-known Odontornithes: Extinct Toothless Birds of North America, a monograph that should be studied by every student of zoology.

¶ Alexander Wilson (1766–1813), the "Father of American Ornithology" was born in Paisley, Scotland, the son of a Paisley weaver. He became a pedlar and while tramping about Scotland ~~an impromptu~~ composed a number of dialect poems that enjoyed a wide popularity, some of them highly praised by the poet Burns. Mixing with politics and being unable to pay a fine inflicted because of certain literary indiscretions he was imprisoned for a time. Smarting under a sense of injustice he emigrated to America.

When employed as a village schoolmaster ~~he met~~ the ~~author~~ made drawings of birds which William Bartram, the naturalist, encouraged him to continue and finally to publish. In 1806 he was appointed one of the editors of Ree's Encyclopaedia and thus acquired the leisure and means to bring out his great work, the seven-volume ~~work~~ American Ornithology. After the appearance of the first volume of this famous treatise he spent the following winter, as he said, "in search of birds and subscribers". In 1876 a statue was erected to Wilson in his native town. He died in Philadelphia at the early age of forty-seven. ¶ Practically all the monographs of this fundamental writer (including the rare variants of title) are in the E. S. W. and Blacker Libraries.

A Although Joseph Henry (1797-1878) did not contribute much to the ~~the~~ systematic literature of vertebrate zoology he, as the first Secretary of the Smithsonian Institution and a man of varied scientific attainments, did much to encourage the study of Zoology. Born in Albany, N.Y. of ~~a~~ Scottish ancestry, ~~he~~ he first attended a country district school and afterwards an Albany academy, to which he was ~~appointed~~ in 1826 attached as teacher. In 1832 he was appointed professor of natural philosophy at Princeton and in 1846 resigned to accept the ~~directorship~~ charge of the Smithsonian. By general consent he was the foremost of American physicists.

A Prince Lucien Jules Laurent Bonaparte (1803-57) son of Lucien and nephew of the Emperor Napoleon Bonaparte, was a scientist and ~~a~~ rarely acted the part of a royal politician. He married in 1822 his cousin Zenaïde Bonaparte, daughter of King Joseph, and at the age of 22 began the publication in Philadelphia of his American Ornithology; a natural history of birds inhabiting the United States, not given by Wilson. Subsequently he published, generally in the U.S.A., numerous papers and treaties on various aspects of natural history as he observed them both in America and Europe, most of which have been collected for the McGill libraries. Despite the handicaps of his royal descent and surroundings he was a devoted and efficient student of nature fit to rank with the best systematic writers on Zoology.

¶ Jean Louis Rodolphe Agassiz was born at Motier, Fribourg, Switzerland May 28, 1807 and studied at Lausanne, Zurich, Heidelberg and Munich. He graduated in medicine in 1830 and early began his uninterrupted and successful career as a naturalist, having in 1829 written an essay on the Fishes of Brazil that was warmly praised by Cuvier. His work was followed by others on ichthyology and by published observations on glacial action. He traveled extensively in Europe and in the United States lecturing (mostly on zoologic topics in) various cities. In the Old and New Worlds In 1848 he was elected professor of natural history at Harvard and henceforth occupied several positions of honor and trust in the United States, declining offers of chairs in European universities. He finally gave all his collections to found a Museum of Comparative Zoology at Harvard — that flourishing activity further developed by his son, Alexander Agassiz (1835-1910). A life of unusual scientific devotion came to an end at Cambridge, Mass., Dec. 14, 1873

The titles by J. L. R. Agassiz that relate to vertebrate zoology will be found in the appended catalogue.

(1823-87)

Spencer Fullerton Baird, foremost American naturalist of his time, was born in Reading, Pa., and graduated from Dickinson College in 1840. It was a meeting with Audubon that turned the young man's attention to ornithology. In pursuit of this study he made long journeys through the country. Later he studied medicine and in 1845 became a professor in Dickinson College, lecturing on various natural science branches. He made large collections of faunal material which became eventually the nucleus of the immense resources of the Smithsonian Institution, of which he became Assistant Secretary in 1850.

His chief scientific labors are on record in the publications of that body, the Reports alone being enough to satisfy the ambition of any man. Coues thinks his treatise on Birds "marked an epoch in the history of American ornithology". In 1878 Baird succeeded Joseph Henry as Secretary of the Smithsonian and in 1877 he died at the age of 64, with complete acquisition of his valuable labors for his country and full of honors conferred on him by almost every civilized government. In addition to his publications on ornithology, Baird wrote a notable Mammals of North America, 1859, as well as many treatises on reptiles. All these are recorded in the appended Catalogue.

(1850–87)

Among the early works on North American mammals is the treatise of the versatile Dr. Richard Harlan, pp. 318, 4to., published in Philadelphia, 1825. His composite work on medicine, zoology and comparative anatomy appeared in 1835.

Revised Check Lists of North American Birds are published by authority of the American Ornithologists' Union every few years. Files of these should be found in every good library on zoology.

In 1878 appeared J.H.Studer's Birds of North America, with 119 hand-colored plates by T. Jasper.

Among local faunists Chas. J. Maynard has contributed much to American literature. His Birds of eastern North America, 1872-81 and his Contributions to Science, 2 vols., 1884-94, form part of these contributions.

¶ Elliott Coues, one of the most brilliant and versatile of American naturalists was born at Portsmouth, N. H. on Sept. 9th, 1842. When eleven years of age he removed to Washington, D.C. where he attended Gonzaga College. Then he became a student at Columbia University, graduating B. A. in 1861 and entering the medical school the following year. After graduation as an M. D. he ~~became~~ entered the U. S. Army and for seventeen years remained in the Service, resigning in 1881 (as Captain) to devote himself entirely to scientific pursuits. During his army life he was stationed at various posts (especially in the far west) at all of which he worked continuously at his favorite subjects. He was fortunate in having as ~~his~~ mentor Professor Baird, under whose guidance he wrote several monographs. On his return to Washington, he contributed largely (among many other tasks) ~~he wrote largely for~~ to the Century Dictionary and devoted many years to the famous Bibliography of Ornithology which, unfortunately, he was not able to complete. ¶ Among the numerous publications undertaken by Dr. Coues was a series of historical scientific

treatises, the first of which appeared in 1893 + dealt with the Expedition of Lewis and Clarke. Coues died at the early age of ~~fifty~~ fifty-seven and the world of science lost one of the most trenchant, analytical, painstaking and ready writers America has ever seen. Practically all his many works are to be found in the McGill libraries, and listed in the appended Catalogue.

A very good account of their natural history is contained in A.E.Verrill's Bermuda Islands, 1902.

Among the publications of the Provincial Museum of Victoria, British Columbia, is a useful Catalogue of British Columbia Birds, by F. Kermode, 1904.

At this place may be mentioned W.A.Bryan's useful Key to the Birds of the Hawaiian Group, 1901.

On several occasions the Compiler has commented on the mass of literature on local fauna contributed by American writers, especially monographs on vertebrate life in various States of the Union. Several early Massachusetts reports on the flora and fauna of that state were published officially by various commissions by Geological, Zoological and Botanical Surveys in 1835, 1838 and 1839, respectively. All these reports are listed in this Catalogue under Massachusetts, State of. Among outstanding examples (and perhaps one of the

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rarest) of these is entitled Nests and Eggs of Ohio Birds by the Jones family, 1879 - 1886, a descriptive hand-colored atlas (68 plates) of which very few copies were issued. The illustrations are superb, accurate pictures of the originals. An early copy is in the Blacker Library.

The first systematic treatise on North American zoology by an American, including an account of new species collected by the Lewis and Clark Expedition, was George Ord's extremely rare North American Zoology, 1815, a reprint of which was published by S.N.Rhoads in 1894.

In 1879 T.L.T. Kumlien published his Contributions to the Natural History of Arctic America, in which L. Kumlein described the Birds and Mammals, while T.H.Bean wrote about the Fishes.

In 1886 appeared Turner's Natural History of Alaska largely devoted to bird life in the far north of the American continent.

During 1888 Belt published his interesting A Naturalist in Nicaragua, an account of one of the numerous natural history expeditions made during the nineteenth and twentieth centuries to Middle and South America.

In 1889 Sclater and Hudson published in London their charming Argentine Ornithology, an amended edition of which was published in 1920 (2 vols.) ~~later~~ by Hudson alone, with the title Birds of La Plata.

In 1889 Cory issued at Boston one of his numerous monographs on the Birds of the West Indies.

In 1890 Warren published at Harrisburg his Birds of Pennsylvania, one of many American contributions to local ornithology.

In its Zoological Series, the Field Museum of Natural History issued a very useful Catalogue of Mammals by D.G.Elliot, Chicago, 1907, not only of North American but of many exotic species.

Here may be mentioned a special treatise by Carl H. Eigenmann, an outstanding work on Cave Vertebrates of America, 4to., published by the Carnegie Institute of Pittsburgh in 1909.

The Marine Mammals of the N.W.Coast of North America are described by C.M.Scammon (and W.H.Dall) in a well-illustrated essay of 319 pages, quarto, published in 1874. ¶ W. T. Grenfell's Labrador, 1909, furnishes a good account of the vertebrate fauna of that desolate coast.

Charles Cory's studies of West Indian Birds, not to forget his monograph on the birds of eastern North America (1899), should be borne in mind, all of them to be found in the present Catalogue. The latest West Indian account of island zoology is the Survey of Porto Rico and the Virgin Islands, 1927-30, of which 31 parts have appeared - a comprehensive and most valuable serial.

¶ Of the many smaller works on American ornithological specialties a well illustrated monograph is A. Pope's Upland Game Birds of the United States, (1878) with 20 colored plates.

Wood. Redpath

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Chapter XIII.

Some Important Treatises and Monographs on Ornithology and Mammology published during the Nineteenth and Twentieth Centuries. (concluded.)

Australasian Zoology:— John Gould — E. P. Ramsay — Walter Buller. — Campbell. — Gregory Mathews — F. McCoy — W. H. D. Le Souëf — Oceania:— Hartlaub and Finsch — A. R. Wallace — J. S. Gardiner — Gould and Sharpe — W. R. O. Grant — Salvadori — Wilson and Evans — Forcester and McGregor — Scandinavia:— Conrad Quesnel — Sven Nilsson — Linnæus — A. J. Retzius — G. O. Sars — H. J. Wheelwright — Gaimard and Quoy — Niel Horrebor — J. E. C. Walter — M. von Wright — J. C. Schiödte — Faber — H. C. Müller — Collin. — Kjaerbolling — Sundevall — Holmgren. — Einar Lönnberg. — Jägerskiöld and Kolthoff — E. L. Schipler — I. Hartling — Collett — Zoology of Germany:— Reichenbach — The Naumanns — J. Sturm — B. Borggreve — Gätke — Lever Kühn — von der Mühle — Reichenow — Zander — Switzerland:— Stolker — Fatio and Studer — H. R. Schinz — P. Blanchard — Irby — Italy:— Count Salvadori — Savi — Giglioli — M. Craveri —

E. G. Dehaut — L. Benoit — G. Motorelli — Arrigoni degli Oddi —

G. Madarasz — Bory de ~~Saint-Vincent~~ Saint-Vincent — S. A. Renier —
non Tristram —

India: — Hume and Marshall — R. A. Sterndale — Chas. Hose —

Kelaart — Legge — G. M. Henry — Blanford and Oates — Huber —

American literature:
Godman and Salvin — Richardson and Swainson — Zoological anatomy —
Nitsche

and Burmeister — J. Rennie — Führbringer — Perrier —

Australia:
M. G. Retzius — Casey Wood — John Gould — J. L. G. Krefft —

Popular ornithology — Sharpe — Frank Chapman — Knowlton and

Ridgway — Stejneger — R. Lydekker — Evans — Pycraft —

Beddard — A. Newton — Stone and Cram — Bertha Sturgis —

French zoology: —
McGregor — H. W. Henshaw — Guthrie-Smith — Vieillot —

Gervais — A. Risso — Benoist — Degland — Lesauvage —

Leslé — René Paquet — Roux — Lapommeraye — Crespon —

Belgium and Holland: — Sélys-Longchamps — P. J. van Beneden —

Dubois — H. Schlegel — Büttikofer — Albarda — Blaauw —

Russia: — A. Humboldt — Eichwald — von Schrenck — E. von Hofmann —

Middendorf — Radde — United States and Canada: — T. H. Streets. —

B. Wilson — Anthony. — Le Moine — C. E. Dionne — E. D. Wintle —

F.E. Beddard — F.C.R. Jourdain — E.G. Boulenger — economic ornithology — E.R. Kalmbach — Junius Henderson — W.E. Collinge — H.K. Job — Bird Banding — Audubon — Alex. Wetmore — Julian Huxley. ////

¶ Of the many ~~[illegible]~~ beautifully illustrated volumes devoted to Australasian ~~[illegible]~~ zoology John Gould's quarto volumes on the Birds of Australia, London, 1837-38 and 1848-69, still hold the palm. As a textual companion to this treatise the author published, London, 1865, a Handbook to the Birds of Australia.

In 1878 E.P.Ramsay issued in Sydney his Tabular List of Australian Birds, with a more complete edition in 1888.

During 1888 Buller published his classic Birds of New Zealand. ¶ ~~[illegible]~~ Comprehensive accounts of the vertebrates of New Zealand have been written (1904) by F. W. Hutton, both alone and in collaboration with J. Drummond.

~~In 1900 appeared Campbell's Nests and Eggs of Australian Birds.~~

In practical value and up-to-date arrangement the remarkable
12 volumes of Gregory Mathews, The Birds of Australia, London, 1911-28, stand pre-eminent.

A good account of local Australian fauna (including vertebrates) is to be found in F. McCoy's serial Natural History of Victoria, 1878-90. Another is a history of the vertebrata of New South Wales given in the Handbook of the meeting at Sydney (1914) of the British Association for the Advancement of Science. Two very interesting volumes on the Wild Life of Australia appeared 1907-9 from the pen of W. H. D. Le Souëf (q.v.).

Apart from the avifauna of Australasia the following works on the birds of Oceania deserve attention.

Regarding the Zoology of Oceania,

In 1867 Hartlaub and Finsch contributed their Beitrag zur Fauna Centralpolynesiën, with an account of the birds.

In 1869 there appeared in New York Alfred R. Wallace's famous Malay Archipelago, mostly devoted to Oceanic birds.

John S. Gardiner wrote (and edited) his noted Fauna and Geography of the Maldive and Laccadive Archipelagoes, 1902-3.

The year 1881 saw the publication of another of John Gould's famous works - completed after his death by Bowdler Sharpe - the Birds of New Guinea.

The fauna of Australasia and other countries of Oceania has also been pretty well described in the various Voyages herein listed, among them the expeditions of Hakluyt, Dampier, La Perouse, and Captain Cook, not to forget the monographs of Latham and many others, ~~including the recent publication in that finely illustrated Birds of Australia in 12 volumes by Gregory Mathews, (1910-27)~~. There must also be mentioned Shaw's Zoology of New Holland (1808), the latter appearing in a second edition entitled A Natural History of the Birds of New South Wales, (1808), with additional plates. There was also a third, posthumous, printing in 1822. # Reference has elsewhere been made to ~~Turning for the moment to Australasia,~~ Surgeon-General John White (fl. 1788-96), who wrote an interesting Journal of a Voyage to New South Wales, 1790, in which he gives an account of the faunal and floral life of that country. The mammalia are systematically described by J. Hunter, the other animals by G. Shaw. This work was translated into French with notes by C.J.Pougens, Paris, 1795-98. A German transcription of the same material, 8vo., 1793, was also published as part of F.A.A. Meyer's Uebersicht der neuesten zoologischen Entdeckungen in Neuholland, etc.

In 1866 Diggles began to issue (in parts) his Ornithology of Australia which (though never completed) continued until 1877, when it was published as two volumes in Brisbane. Among other works on zoology of his period Ramsay published his Tabular List of Australian Birds. In 1883 A.J.Campbell's Nests and Eggs of Australian Birds appeared - a most useful manual. In recent years Leach's Australian Bird Book (first printing 1923), a valuable handbook, has been very popular.

The islands of Oceania have a considerable literature all their own, only a fraction of which can be mentioned :- Hartland and Finsch's Beitrag zur Fauna Centralpolynesians, Halle, 1867; Wigglesworth's List of Polynesian Birds, Dresden, 1891; T. Salvadori's Ornitologia della Pepuasia e delle Molluche (and an Aggiunte) 1880-91.

In addition to the Polynesian avifauna described in the voyage of the "Challenger" several informing works appeared since the earlier contributions, the last of which being Gregory Mathews' Birds of Norfolk Island (1928), and Casey Wood and Alex. Wetmore's Birds of Fiji, 1925-26.

Among the works dealing with the avifauna of Australasia is Sir Walter Buller's Birds of New Zealand in two editions, 1872-73 and 1888, finely illustrated with drawings by Keulemans. In 1882 Buller brought out a useful Manual based on the first edition of his Birds. Many of the orighal drawings made by Keulemans for these treatises are in the Blacker Library.

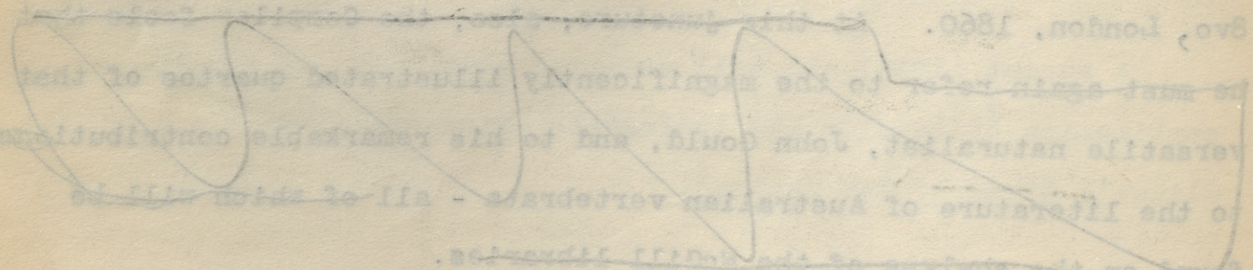
G.R.Gray also contributed studies of New Zealand birds, in his Appendix to Diffenbach's Travels in New Zealand (1843) and in the Zoology of the "Erebus and Terror" (1844-76).

Of special systematic value is F.W.Hutton's Catalogue of the Birds of New Zealand, 1871.

A recent (1930) and well executed work, with an excellent combination of popular and systematic attractions, is W.R.B. Oliver's Birds of New Zealand.

Another early and well-known contribution to the vertebrate zoology of Australia is George Shaw, the author, inter-alia, of the Speculum Linnaeanum: or Linnean Zoology (4to., 1790). He, too, was associated with John White and used the material and observations, gained during his own Australian travels, in several publications.

Still another comparatively early and well-known naturalist-traveler was Philip Parker King (1793-1856) who wrote several works on the natural history of the Austral continent. He was the editor of a two-volume Survey of ... the Western Coasts of Australia, between 1818-22, 8vo., London, 1827, in which the vertebrate fauna were described by J.E. Gray. Here must be mentioned, also, the wide wanderings of George Bennett who, among other books, wrote the attractive Gatherings of a Naturalist in Australasia, etc. 8vo, London, 1860. ~~At this juncture, also, the Compiler feels that he must again refer~~ to the magnificently illustrated quartos of that versatile naturalist, John Gould, and to his remarkable contributions to the literature of Australian vertebrata - ~~all of which will be found on the shelves of the McGill libraries~~.



A description of the Birds of Malaysia is given by W.R.O. Grant in Annandale and Robinson's Fasciculi Malayenses, 1903.

During 1882-91 Count Salvadori published in Turin his Ornitologia della Papuasia e delle Mollueche.

Wilson and Evans brought out (in 1884) their pioneer treatise on the Birds of the Sandwich Islands, followed (1893-1900) by the beautifully illustrated Avifauna of Laysan, including an up-to-date systematic description of some birds of Hawaii.

Worcester and McGregor published their work on birds of the Philippine Islands in 1906.

Much of the literature describing the fauna - especially the birds - of the Philippines will also be found in certain periodical publications, e.g. the Philippine Journal of Science (edited by McGregor); in the Journal f. Ornithologie; Ibis; Proc. Zool. Soc., et al.

As previously mentioned, Scandinavia is well represented in faunal literature, native and foreign. An early writer, Conrad Quensel (1767-1806), although mostly a botanist, wrote (in conjunction with others) Svensk Zoologi, 1806, while Sven Nilsson, under the caption Skandinavisk Fauna wrote, between 1820 and 1855, and published in Lund, a series of monographs pretty well covering the whole range of Scandinavian vertebrates.

The Swedish flora and fauna catalogued by Linnæus were fully described by that voluminous writer Anders Johan Retzius (1742-1821) in numerous essays on the subject. In the production of these treatises he was associated with fellow naturalists. One of the monographs that interest us is his Fauna Suecicae, pars prima (vertebrata), 8vo., 1800. Of the same character as Retzius was Georg Ossian Sars (1837 - ?1909), who with collaborators (Daniel C. Danielssen, 1815-1894, for example) described the marine life of northern European seas and made many contributions to the oceanic fauna of other localities.

Writing under the pen-name of "An Old Bushman" H.J. Wheelwright has written (1852-57) a number of monographs on Swedish and general Scandinavian vertebrate zoology. See the present Catalogue.

A survey of the flora and fauna of Iceland, Greenland, Lapland, Spitzbergen, the Feröes and ~~the~~ neighbouring islands was made by a French Commission scientifique between 1835 and 1846 in the corvette "Recherche". The results of these expeditions were published, 1842-44, in nearly 30 volumes, an immense work of great importance. We are chiefly concerned with the faunal descriptions, given by one of the zoologists, Paul Gaimard (1790-1858), who described many new species, especially in the Voyage en Islande et au Gröenland ... 1835-36, published Paris, 1840-44, 6vols., text, 3 atlases with 25o plates. Associated with the name of Gaimard is that of Jean René Constant Quoy (1790-1869) whose combined and original contributions to [redacted] zoology are so well-known in connection with the famous voyages of the "Uranie and Physicienne" and the "Astrolabe", 1817-18.

A contribution to the faunal history of Iceland well worth mentioning is Niel Horrebor's Account, published in London, in 1758.

A monograph on Scandinavian ornithology, in both Danish and German, was published by J.E.C.Walter in 1828, a second edition appearing in 1832.

Magnus von Wright's Finlands Foglar, 1873, is one of the best studies of the birds of Finland yet published.

During 1878-1907, J.C.Schiödte published Zoologia Danica, which, though incomplete, is an interesting semi-popular account of faunal life in Denmark.

Of other northern (sub-arctic) ornithology ~~in particular~~, the birds of Iceland have been well described by Faber, whose Prodromus der isländischen Ornithologie, was published as early as 1822. Since that date several travelers and various expeditions have furnished additional information regarding sub-polar fauna, birds in particular, Of these mention may be made of Baring-Gould's Iceland; its Scenes and Sagas, 1862. H.C.Müller has described the birds of the Faeroes in his Faeröernes Fuglefauna, 1822, better known in its German translation.

Scandinavian ornithology, both general and local, is well presanted in Collin's Skandinaviens Fugle, 1873; by the avifauna ~~of~~ Nilsson's Skandinavisk Fauna, issued in 2 vols., 1858; by Kjaerbolling's Danmarks Fugle; by Sundevall's Svenska Foglarna 1856-73; and by Holmgren's Skandinaviens Foglar, 2 vols., 1866-73.

Attention must be drawn to the recent work of

~~Perhaps the greatest~~ Einar Lönnberg, ~~had almost completed~~ the last edition (1917-29) of that classic treatise Svenska foglar - the Birds of Sweden, originally written by the Wrights, M. and W. The first edition appeared during 1828-38, and was the principal authority on the subject.

A valuable contribution to the systematic study of North European bird life is Nordens Fäglar, now in course of publication, (1911-26, 48 parts) by Jägerskiöld and Kolthoff.

A truly great and well illustrated treatise (8 vols) that was intended to include the avifauna not only of Denmark but of Greenland, Iceland and the Färoes is Eiler Lehn Schiøler's (1874-1929) Danmarks Fugle. Two volumes had already been published and a third was under way when the distinguished author died.

A more recent and valued publication on avian life is Ivar Hartling's (1929) Ornithologist Handbok ... over all i Finland fagelarter.

has been noted, the avian literature of Norway is quite voluminous, of which one may quote Collett's Norges Fugle that first appeared in 1868 with a supplement in 1871 and an English translation by Cocks in 1894. Collett has also written an original work in English entitled The Ornithology of Northern Norway.

A new and very important contribution to Northern faunal literature is the account (not yet completed) given under the title Fauna arctica, 1900 to date. Several writers of note are included in this series, F. Römer, F. Schaudinn, A. Brauer and W. Arndt among the number.

Several pages might easily be filled with a list of works on the zoology of Germany, in particular treatises on its avifauna, or rather upon the bird life of Central Europe. The most important of these appear (with brief annotations) in the appended Catalogue; only a few of the outstanding titles will be referred to here.

Although the complete series of H.G.L.Reichenbach's faunal cyclopedia, Naturfreund (1834-63), is almost unobtainable yet parts of it are available and form a valuable contribution to general vertebrate zoology.

As already pointed out, of treatises on avifauna germanica the systematic volumes of the two Naumanns head the list. The various editions of these treatises, with their scientifically arranged text, beautiful plates, and well-printed pages, form models after which other faunal cyclopedias may well be fashioned.

Of the many early nineteenth century efforts to describe and depict the fauna of Germany, local and general, the Compiler wishes to draw attention to the works of Carl Ludwig Koch (1778-1857) who, although he is best known as a writer on the articulata and other invertebrates of middle Europe, also published several treatises on the vertebrate zoology of Germany. Among these were Deutschlands Fauna (written with J. Sturm); System der Bayerischen Zoologie, 8vo., Nürnberg, 1816; and Fauna Ratisbonensis, 8vo., 1840, in collaboration with A.E.Fuernrohr.

One of the illustrators that furnished valuable information for the student of German nineteenth century biology was the Nuremberg artist-naturalist-engraver Jacob Sturm (1771-1848). In conjunction with several others he depicted with fidelity the flora and fauna of Central and Northern Europe. We are mostly concerned with his Deutschlands Fauna in Abbildungen nach der Natur, mit Beschreibungen, 4 parts, Nuremberg, 1797-1857; a fifth part, contributed after his death, by his son, J.H.C.F. Sturm. This is a magnificent series (about 25 vols.) well written and illustrated by hundreds of colored plates.

Newton (Dictionary, p.39,) commenting on the numerous works on the Birds of Germany, contents himself with an alphabetical list of the chief contributors. If we add some twenty or thirty names to the collection we may (by reference to the pages of the present Catalogue) gain a fair knowledge of the avifaunal literature of Middle Europe as it appeared in book form during the past 150 years. In passing, attention is drawn to Die Vögel-Fauna von Norddeutschland of Bernard Borggreve, 1869, that appends a bibliographical index of all the important literature on bird life to the date of publication.

This roster of Central European literature on bird lore displays the names of Brehm (the elder and younger), von Droste, Gätke, Gloger, Hintz, Holtz, Alexander and Eugen von Homeyer, Jäckel, Koch, Konig-Warthausen, Krüper, Kutter, Landbeck, Landois, Leisler, Leverkühn, von Malzan, Matschie, Bernard Meyer, von der Mühle, Neumann, Reichenow, Tobias, Johann Wolf and Zander - most of whose writings have found a place on McGill Library shelves and are listed in this Catalogue.

It must be remembered that certain well-known German ornithologists have written much about foreign bird life and little about the avifauna of their own country, among them Cabanis (editor of the Journal für Ornithologie), Finsch, Hartert, Hartlaub, Heine, Prince Max of Wied, A.B.Meyer, Nathusuis, Nehrkorn, Reichenbach and Schalow. To the above list may be added the South-German ~~names~~ von Pelzeln. ~~Victor~~ von Tschusi zu Schmidhofen wrote a monograph on Tyrolese birds, 1877, as well as an ornithological bibliography of Austria-Hungary, 1878, ~~was published by the latter.~~

The literature of Switzerland's ornithology is furnished in a useful Bibliographia Ornithologica Helvetica by Stölker in the Bulletin de la Société Ornithologique Suisse, Vol. II, p.90, which gives a list to date of publication on Swiss birds. The names of Fatio and Studer ~~(q.v.)~~ are among the most prominent; ~~their works are fully described in the Catalogue.~~

As regards Swiss vertebrates, one of the most reliable of the earlier writers on the subject is Heinrich R. Schinz (1777-1861) who in addition to numerous monographs on the fauna of his native land, e.g., Verzeichniss der in der Schweiz vorkommenden Wirbelthiere, 4to., 1837, published several works on European and general zoology. One of the former, in 2 vols., Stuttgart, 1840, is entitled Europäische Fauna.

The fauna, especially the birds, of Portugal have several times been described, in one instance rather well by an early, rare and excellent five-volume work on vertebrate zoology by Pedro Blanchard (1817-1819); the Thesouro de Meninos; Resumo de Historia Natural, etc., Lisbon; later, the birds by Barbazo du Bocage, Catalogue das Collecoes Ornithologicae, 1869.

The birds of Spain have not received, relatively, much attention although Irby's Ornithology of the Straits of Gibraltar (two editions, 1875 and 1895) and Abel Chapman's Wild Spain (1893) cover the ground fairly well.

¶ The overlapping of Romance literature is seen in zoology as well as in other departments of book-making, and there are several French faunal works that include the zoology of the Iberian peninsula and its neighbourhood.

¶ Italy is well represented by numerous works on vertebrate zoology, especially by the Fauna d'Italia, the second part of which, Uccelli, from the pen of that eminent zoologist, Count T. Salvadori, contains a good bibliography of Italian avifaunists. This author has written, among other treatises, an excellent Elenco degli Uccelli Italiani (1887) and Savi an Ornitologia Italiana, in 3 volumes, 1873-77. Still another and much more elaborate treatise is Giglioli's Avifauna Italica, in 4 volumes, 1886-91.

It will be remembered that Prince Lucien Bonaparte also wrote an Iconografia della Fauna italica, Roma, 1832-42, in 3 folio volumes.

The animal life of Sicily and its neighbourhood was thoroughly described in several monographs by Oronzio Gabriele Costa, (1787-1867). The earliest of these general descriptions is furnished by his Fauna del Regno di Napolia, etc., in 11 vols., 4to., col. ill., (1829-86), this monumental work having been continued by his son, Achille Costa, after the death of the father.

Among the noteworthy nineteenth century writers on natural history was Alfred Malherbe, author of several monographs on Mediterranean flora and fauna; also his Faune ornithologique de la Sicile (1843) and similar works on the birds of Algeria (1846 and 1855). Even more important is his two-volume (with Atlas) folio (Metz, 1861-62), the Monographie des Picidees, ~~etc. - all listed in the Catalogue.~~

A rather early, pretty complete (and rare) catalogue of Italian vertebrate fauna was compiled by Giglioli in 1880.

An Italian translation (1926) with notes, of Louis Figuier's popular work on bird life by Michele Craveri gives a fair account of birds in general with a more extended history of Italian avifauna.

E.G.Dehaut began in 1911 to issue Materiaux ... pour l'histoire zoologique ... de Corse et de Sardaigne. In the half-dozen fascicles so far published a very good systematic account of Mediterranean vertebrates is given.

Somewhat earlier (1840) Luigi Benoit in Messina had published his Ornithologia Siciliana.

G. Motorelli's Monografia on the birds of Sardinia, 1895, is a well written and well illustrated systematic essay, ~~on the subject~~, although Count Salvadori's Catalogo degli Uccelli di Sardegna (1864) made a good foundation for it.

M. Craveri's (1927) Atlante ornitologico; Uccelli italiani, Milan, 300 figs. on 50 col. plates, with descriptive and explanatory text, is a very useful, well arranged work showing the majority of Italian birds at a glance. Both the indigenous and migratory avifauna are pictured for the use of students and visitors, the systematic, as well as the popular names of species being given.

E. Arrigoni degli Oddi published in 1929 his Ornitologia, (36 col. pl.), an up-to-date account of birds of the world, an elaborate extension of the author's Manuale di Ornitologia Italiana, 1904.

The best account of the birds of Hungary is furnished by the works of G. Madarasz (1899-1903.).

Countries bordering on the Mediterranean were, during the troublous Napoleonic years, examined from time to time as to their faunal life by Baron Bory de Saint-Vincent, the results of which have been given by him and other writers.

The faunal life of the Adriatic and its shores was examined and reported on by Stefano Andrea Renier (1759-1830) in a posthumous, illustrated work entitled Observazioni posthume di Zoologia Adriatica, Venice, 1847.

Greece, Turkey and the Levant are partly represented in Tristram's Flora and Fauna of Palestine, 1884, and Shelley's Birds of Egypt, 1872.

A note may here be made of the faunal literature of the Far East. Hume and Marshall wrote on Indian Game Birds (1878-80), and on the Nests and Eggs of Indian Birds by Hume alone, 1889. These volumes may be regarded as supplementing the classic work of Oates and Blanford (q.v.), especially their monumental treatise on the Fauna of British India, 1889-90.

A profitable work on the Mammalia of Ceylon and India was published by Robt. A. Sterndale in 1884.

A brief but useful account of the mammals of Borneo is furnished by Chas. Hose, 1893.

¶ Ceylon has received abundant attention from zoologists. In 1852 was published Kelaart's Prodromus Faunae Zeylanicae; Tennent's Sketches of Natural History in Ceylon (1861); Legge's Birds of Ceylon (1878-80) with admirable colored plates by Keulemans, and (in 1925) Wait's Manual of the Birds of Ceylon.

¶ There is now (1927-29) in course of publication a series of 48 Coloured Plates of the Birds of Ceylon, which will reproduce drawings by G.M.Henry, made on the spot from live specimens of indigenous Island Life. This is a Colonial Government publication, the original drawings being loaned for the purpose by the Compiler of this Introduction and Catalogue.

Continental India has had a large share of literary contributions to studies of its fauna, much of it appearing in periodical literature. A Government series of great value, The Fauna of British India by Blanford and Oates, (Stuart Baker is now engaged on a second edition - in six or seven illustrated volumes - of the Avifauna) is the most important of these treatises, although Jerdon's Birds of India (1862-64) must be given first place as a forerunner. Blyth's posthumous Mammals and Birds of Burma (1875) ~~and Allan Hume's Nests and Eggs of Indian Birds (1873-75)~~ must not be omitted from any bibliography, however, incomplete, of Indian zoology.

Of the numerous contributions to a study of animal - especially avian - flight in its relation to aeronautics, a rather sensible study is an early one by Jean Huber, Observation sur le vol des Oiseaux de proie, 1784.

¶ Here one may once more remind the reader of two remarkable books, first, ~~Of sumptuously illustrated monographs~~ that monument of industry, Godman and Salvin's Biologia Centrali Americana, 1879-1915, ~~furnishes a fine example. It is~~ in which all the vertebrate sub-classes are wonderfully well described and depicted.

To be bracketed with that fine collection is the much earlier Fauna Boreali-Americana, ~~already mentioned~~, the quadrupeds and fishes by the Editor, Sir John Richardson; the birds by W. Swainson and Richardson.

¶ Of works on the morphology of bird life,

In 1867 there appeared in London an excellent translation of Nitsche and Burmeister's (1840) classic work, System der Pterylographie, still an authority on the plumage distribution of birds.

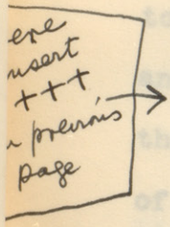
Contributions to the scarce literature on fossil eggs have been made by the Compiler. See his essays on the Fossil Eggs of Bermudan Birds (by Casey A. Wood, 1923), and A Fossil Bird's Egg from the Post-Tertiary Mud-Rocks of Fiji, 1925.

Of anatomical books on birds one of the best is James Rennie's Bird Architecture, London, 1844.

A very important original work of reference, familiar to all research workers, is Führbringer's (1888, Amsterdam) Untersuchungen zur Morphologie u. Systematik der Vögel.

Of the many text-books with anatomical illustrations is J.O.E.Perrier's admirable Traité de Zoologie, 1893-1928.

On the organs of special sense, M.G.Retzius' Das Gehörgan der Wirbelthiere, in two illustrated volumes, 1881-84, is probably the most complete of otologic treatises.



A book notable for the colored illustrations characteristic of the author is John Gould's Mammals of Australia, 3 vols., 1845-63.

In 1871 J.L.G.Krefft published his folio, the Mammals of Australia, illustrated, preceded, in 1868, by his Notes on the Fauna of Tasmania.

The end of the nineteenth century and beginning of the twentieth century saw the publication of many semi-popular volumes, generally well-illustrated in color, describing and depicting the birds of the world. Of these may be mentioned Sharpe's Royal Natural History, four volumes, of which (1898) are devoted to bird life; Frank Chapman's Bird Life, N.Y., 1898; Knowlton and Ridgway's (1909) Birds of the World - one of the best - and the Standard Natural History, published in Boston, the ornithology of which was (1885) edited by Stejneger, and the Royal Natural History, 1893-96, edited by R. Lydekker, who also wrote on the vertebrates. To this list may well be added two admirable compilations on avifauna, Evans (1900) in the Cambridge Natural History Series, and Pycraft's History of Birds, published in London, 1910.

A scientific monograph on the Structure and Classification of Birds was published by Beddard, London, 1898. A few years before (1896) had appeared the first edition of Alfred Newton's famous classic, A Dictionary of Birds.

Returning to the other vertebrate classes, it will be noted that in 1902 was published Stone and Cram's American Animals, a work of great practical value to students. Shortly before this C.L.Herrick had written (1892) his excellent Mammals of Minnesota.

A useful manual is the recently issued (1929) Field Book of Birds of the Panama Canal Zone by Bertha Sturgis.

Richard C. McGregor has furnished us with a full description (1903-24) of the avian fauna of the Philippine Islands. A a very od popular and systematic account of Hawaiian birds is given y H. W. Henshaw, 1902.

The popular writer on New Zealand fauna, H. athrie-Smith, published in 1927 an interesting book entitled Birds of the Water, Wood and Waste.

French literature on vertebrate zoology is quite voluminous. In addition to that already noted, one of the most valuable and extensive undertakings ~~in the way of a systematic history of a country's fauna~~ is the Faune Française ~~etc.~~ by Louis P.G.Vieillot (1748-1831) and other French naturalists. Eight volumes and and Atlas were published between 1820 and 1823; in a sense contributions have been made to it ever since, if (among many others) one includes such additions to the History as Paul Gervais' Zoologie et Paléontologie française, 4to., Paris, with an Atlas, 1850; second edition, 1859.

The fishes and other marine animals inhabiting the coastal waters of Southern France were, early in the nineteenth century, studied and described by Antoine Risso, in his Ichthyologie de Nice, 8vo., Paris, 1810, followed by his Histoire naturelle des principales productions de l'Europe meridionale, ~~etc.~~ 5 vols., ~~&c.~~ Paris, 1826.

Local French fauna, especially birds, are well described by a large number of writers whose productions are listed in this Catalogue. These are (vide Newton) chiefly Benoist, Baillon, Blandin, Bureau, Canivet, Chesnon, Degland, Demarle, De Norguet, Gentil, Hardy, Lemetteil, Lemonnicier, Lesauvage, Maignon, Marcotte, Noury and Teslé. To this category may be added the more modern names of Menegaux, René Pauquet and many others.

The last-named, under the pseudonym Nérée Quepat, has written an interesting Ornithologie Parisienne; Roux, Ornithologie Provençale, 2 vols., 1825-29; Risso, Histoire Naturelle des environs de Nice, 5 vols., 1826-27; Jaubert and

Lapommeraye, Les Richesse ornithologiques du Midi de la France, 1859-61; Bailly, Ornithologie de la Savoie, 4 vols., 1853-54; Bouteille and Labatie, Ornithologie du Dauphiné, 2 vols., 1843-44; and two interesting monographs by Crespon, Ornithologie du Gard, 1840, and Faune Meridionale, 2 vols., 1844.

The faunal vertebrate life of Belgium has been frequently described, the best of the earlier treatises being by M.E. de Selys-Longchamps (1813-1900), entitled Faune belge; a monograph that long remained the chief authority on the subject.

As previously mentioned, Pierre J. van Beneden (1809-1894) devoted most of his energies to a study of the fishes (living and fossil and other marine life of the Belgian coast but he also published occasional papers on the terrestrial animals of the Low Countries and other localities.

A well-known treatise, published 1851-60, the Planches coloriées des Oiseaux de la Belgique, by Ch. H. Dubois fully covers the avifauna. This work was so well received that it was supplemented by many additions and appeared (in 1861-64) as the Planches coloriées des Oiseaux de l'Europe. Between 1876 and 1894 Alphonse Dubois, son of Ch. F. Dubois, published a Faune illustrée des Vertébrés de la Belgique (2 vols. text, 2 vols. atlas) which is at the moment the best all-round work on the vertebrate zoology of Belgium. Newton draws attention to the excellence of the text-maps showing the geographical distribution of Belgian animal life.

¶ Of the many Dutch works on local vertebrate zoology, there is room to mention ~~the works of~~ that eminent family of naturalists, the Schlegels. Hermann Schlegel's De Dieren van Nederland, 1861, and his De Vogels van Nederland, in their various editions (1854-78) furnish a useful account of Holland's vertebrate fauna. Among other authors of importance that have written on the animal life of the Dutch possessions we notice Büttikofer, Crommelin, Jentink, Albarda and Blaauw.

Denmark's faunal life is described in a serial, Danmarks Fauna, issued by the Danish Natural History Society (1907-date) and is well worth the (ist) udent's attention.

The explorations of Alex. Humboldt in various regions has several times been mentioned. In 1829 he visited Asiatic Russia with the equally well-known naturalist-traveler, Christian G. Ehrenberg (1795-1876) whose contributions to the literature of vertebrate zoology have already been noted. The travels in southern Russia of Prince Demidoff (1812-70) are described in a Voyage dans la Russie meridionale, 4 vols., 2 atlases, 1840-42, in which the zoology of that region is to some extent pictured.

The Caucasus was explored in 1825-26 by Carl Eduard von Eichwald (1795-1876). This naturalist is among the best known writers on Russian floral and faunal life, both living and fossil. Among his publications are not only the Reise auf dem Caspischen Meere und in den Caucasus, 2 vols., Stuttgart, 1834-38, but other works of interest to zoologists, e.g. Lethaea Rossica, ou Paléontologie de la Russie, 3 vols. and atlas, Stuttgart, 1852-68.

Another voyage undertaken in the interests of Russian natural science was Peter Leopold von Schrenck (1826-94), reported in the Reisen und Forschungen im Amur-Lande ... 1854-56, with colored illustrations, St. Petersburg, 1858-1900. Much of the fauna of northern Europe and Asia is well described in these interesting reports by Schrenck himself.

A survey of the Russian Empire under the auspices of the Russian Geographical Society in which Ernest von Hofmann (1801-1871) gave an account of the zoology is entitled Der hördliche Ural und das Kustengebirge Pae-choi, Bd. II, St. Petersburg, 1856. Much more important and better known are the classic works of Alex. T. von Middendorff (1815-1894), especially the Reise in den äussersten Norden und Osten Sibiriens ... 1843-44, 4 vols., and atlas, St. Petersburg, 1847-75. This author has also written other treatises that include Russian vertebrates. Radde's Ornis Caucasica, a biological-geographical study of great value, really one of the Russian naturalist's reports on the fauna of the Empire, and of his various trips throughout the Czar's vast dominions.

A valuable contribution to the vertebrate zoology of United States territory is the monograph of Thos. H. Streets on the Natural History of Hawii (1877) in which he has included Fanning Island and Lower California. This essay was originally contributed as Bulletin No. 7 to the U.S.National Museum.

One of the several treatises on the Birds of Hawaii is S.B.Wilson's Aves Hawaiiensis, 1890-99, an excellent systematic work,completed with the help of A.H.Evans and Hans Gadow.

Anthony's Field Book of North American Mammals, 1928) is to highly recommended.

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Anthony's Field Book of North American Mammals, 1928) is to highly recommended.

In 1860 (second edition 1861) Le Moine published his Ornithologie du Canada, followed in 1866 by his Birds of Canada but none of these titles rose to the dignity of a complete study of the subject.

Other important titles in Canadian zoology are by C.E.Dionne, Les Oiseaux de Canada, 1883, and a Catalogue des Oiseaux de la Province de Quebec, 1889.

A local Canadian naturalist, Ernest D. Wintle, published in 1896 a very interesting volume, the Birds of Montreal, pp.14 + 281, with two plates and a map.

¶ Reference must again be made to that excellent work on Mammalia (1902) by F.E.Beddard as Volume X of the Cambridge Natural History. ¶ F.C.R. Jourdain's contributions to recent ornithologic literature include his Eggs of European Birds, 1906-09.

A probably the best popular work on general zoology is ~~one~~ in four volumes, Living Animals of the World (about 1927), by E.G. Boulenger, W.P.Pycraft and others, ~~and~~ published by Hutchinson and Co., and profusely illustrated.

An instructive work on the breeding of wild birds is H.K. Job's Propagation of Wild Birds, 1902.

Economic ornithology is a wide subject barely touched in this Intorduction, but it may be well to draw the student's attention to Junius Henderson's up-to-date digest of North American literature on the subject in his Practical Value of Birds, 1927. Perhaps the publications of the U.S. Dept. of Agriculture (Biological Survey in particular) are the most important and valuable contributions to this subject. One of many examples is E.R. Kalmbach's essays, mostly compiled for the Farmer's Bulletin - on the economic relations of birds to agriculture, 1920-30.

Chiefly because of the rarity of monographs on the subject ~~of economic ornithology~~ one values Walter E. Collinge's Study of the food of some British wild birds, 1913.

~~Because of the rather unusual novel treatment of the subject the advanced student may well read~~

The literature of Bird Banding (as a part of the study of Migration) is of comparatively recent date. Alex. Wetmore (Encly. Brit., 14th. ed., p.927) refers to the attempt to mark wild birds with small bells, paint, colored yarns, etc., as much as 125 years ago but it was not until the widespread introduction of aluminium bands that the methods became of scientific value. Audubon placed silver-wire rings on common phoebes to test their return to certain breeding localities. In 1899 C.C.Mortensen of Denmark began in systematic fashion to band ducks, starlings, storks and birds of prey. Such good results followed that the plan was everywhere adopted.

The American Bird Banding Association began its work in 1909, afterwards taken over by the Bureau of Biological Survey, Dept. of Agriculture at Washington. Now more than 1500 persons are regularly engaged in the work and more than 350,000 birds have been banded. The accounts of this enterprise are found mainly in Bird Banding Notes, a monthly mimeographed periodical (1922 to date) issued by the U.S. Bur. Biol. Survey at Washington.

If In this connection may be studied Dr. Wetmore's able instructive Migration of Birds, 1926.

The literature of the ~~not~~ courtship, (of animals through mating & reproductive habits) very large is important & interesting. The chief authority on this subject is Prof. Julian Huxley whose essays on this subject ~~as~~ form part of the treatises listed in the accompanying Catalogue.

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~~XIV~~

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Chapter XIV.

The Literature of Zoogeography. Vertebrate ~~Fauna~~ Ecology. Vertebrate Paleontology. Animal Psychology. Zoological Gardens, Museums and Stations.

A. R. Wallace — Prince of Monaco — Anton Dohrn — K. A. Mobius — E. A. W. Zimmermann — Treviranus — Illiger — J. A. Wagner — C. Pickering — Peter Pallas — Agassiz — Prince Bonaparte — Gloger — Schmarda — von Sars — E. Forbes — Oersted — Bartholomew — A. Dubois — T. H. Huxley — E. Forbes. — Frank Chapman — ~~R. W. Mecca~~ — ~~Prince of Monaco~~ — ~~Mobius~~ — R. Hall — R. F. Scharff — F. Beddard — A. Murray — C. J. G. Petersen — J. Schmidt — Karl Semper — Edward Cope — A. Heilprin — G. P. Moore — Migration of Animals — von Homeyer — Wetmore — A. Rauber — W. Roux — H. Speman — Jacques Loeb — Yves Delage — Agassiz and Gould — Lydekker and Nicholson — C. Meyer — A. S. Woodward — von Zittel — T. Fechner — W. Wundt — A. Lehmann — A. Rauber — W. Roux —

H. Przibram — Reports of Zoological Stations — U.S.A. — Louis Agassiz — W. K. Brooks — Wood's Hole — Pacific Grove and ~~Catalina~~ Tolla, California — N. Y. Zoological Station in British Guiana — Barro Colorado, Panama Canal Zone — Helgoland Observatory and other European Stations — Natural History Museums of the World and their Reports.

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Quite a few naturalists of importance have given ~~their~~ much time ~~and energies exclusively~~ to the study of geographical biology or to that division of it commonly known as zoogeography. Some general zoologists, like Alfred R. Wallace, have written extensively on the subject, and among those of that class not previously mentioned one must remember the oceanographic work done at the various marine stations, (that carried on, for example, ~~[illegible]~~ by the Prince of Monaco. Among the earliest of these is the ~~[illegible]~~ Aquarium at Naples, founded by Anton Dohrn (1840-1909). However the Zoologische Jahresberichte and other publications, 1870 to date, of this famous scientific center are, like so many of its class, mostly taken up with studies of marine invertebrates, inhabiting the plankton and other submarine areas. In consequence they find no place in the present compilation and Catalogue. ¶ (new par) Among the pioneers in this field who studied local vertebrates as well as ~~the~~ other forms of marine life was Karl August Möbius (1825-1908). His famous book Die Fauna der Kieler Bucht, 1865, is a model of its kind; he measured carefully the estuary that he describes so that he might report upon the exact positions and areas its marine animals and plants occupied. Indeed, Möbius may be said to be the father of modern ecology.

As pointed out by Victor Carus, in a study of general zoogeography one should bear in mind the comparatively early contributions to that subject by Eberhard A.W.von Zimmermann (1743-1815). In 1777 he published in Leyden Specimen zoologiae geographicae, quadrupedum domicilium et migrationes sistens, pp. 685, 4to, followed by a much enlarged German edition, 1778-83, Leipzig, in 3 volumes. These treatises were ~~followed~~ succeeded by several other contributions to the same subject, e.g. those of Rudolph Christian Treviranus (1779-1864), Neue Untersuchungen ... der thierischen Körper, Bremen, 1835; J.C.W. Illiger (1775-1813)..., Prodomus systematis Mammalium et Avium, Berlin, 1811, and other essays of similar import.

In 1873 N.A.Syevertzov (1825-1885) wrote an essay on the vertical and horizontal distribution of Turkestan animals.

Peter Pallas has given us a good idea of the distribution of faunal life throughout the old Russian Empire in his Zoographia Russo-Asiatica, 1831, and in his other voluminous writings.

Johann A. Wagner (1797-1861) published Die geographische Verbeitung der Säugethiere, München (?), 1845; (the American) Charles Pickering (1805-1878), The Geographical Distribution of Animals and Plants, fol. 1854-76 (and 1863), Boston, one of the reports of the United States Exploring Expedition under C. Wilkes; Karl Ludwig Schmarda, Die geographische Verbreitung der Thiere, pp.755, Wien, 1846; to which may be added, among many essays and treatises, the studies of Agassiz and Schlegel, who, in addition to registering and mapping the regions occupied by faunal species have advanced hypotheses and theories to account for the areas and limits of habitat and migration.

An edifying example of zoogeographical treatment is Prince Bonaparte's geographical and comparative List of Birds of Europe and North America, 1838.

The early efforts of Michael Sars (1805-1869) to do for submarine or oceanic depths what many others have since his time done for mountain flora and fauna in the establishment of ~~[illegible]~~ zones of elevation as part of zoogeography, must not be passed in silence.

As early as 1833 C.W.L.Gloger wrote Das Abandern der Vögel ... durch Einfluss des Klima's, und bei den Europaischen Saugethieren.

Sars' Fauna littoralis Novegiae, ~~Norsk Pid. Christiania~~ 1846-77, gives a fair account of his theories and one might here point to the recent work of Frank S. Chapman in South America in which he successfully relates the occurrence of definite faunal species with well-defined altitudes, ranges of temperature, amount of rainfall, etc.

One of the comparatively early studies in ornithological zoogeography is seen in A. Dubois' Conspectus systematicus et geographicus Avium Europaearum, 1871. In the same year T.H.Huxley delivered his celebrated lecture on the Geographical Distribution of Animals.

Further examples of zoogeography based on physical conditions are several papers by Edward Forbes (1815-1854), including the Connexion between distribution of the Fauna and Flora of the British Isles ... and geological changes, Memoirs, I., 1846, that contain valuable data on that subject. Later he elaborated his theories (as to homozoic belts) the result of studies made on the zoological collections gathered during the Voyage of the Herald, 1852-54, and from other expeditions of like character.

Another edifying account of avian distribution (in Australasia) is R. Hall's Key to the birds of Australia and Tasmania with their geographical distribution, 1899.

As exemplifying the many hypotheses advanced to account for faunal distribution Anders S. Oersted (1816-1872) endeavored to prove that the coloration of fishes depends largely upon the depth zones which they inhabit. See his De regionibus marinis, ~~Quæ Hauniæ~~, 1844.

A most valuable and graphic guide to regional zoography is Bartholomew's Atlas of Zoogeography, with numerous colored maps.

In the domain of local avian distribution a painstaking work is now (1930) being issued in parts by H.G.K.Molineux giving a Catalogue of Birds and their Distribution in the Western Portion of the Palaearctic Region.

A thoughtful work on zoogeography is R.F.Scharff's European Animals; their geological history and geographical distribution, 1907.

F. Beddard in 1895 wrote a Text-book of Zoogeography for the Cambridge Natural Science Manuals.

Andrew Murray has written a very important quarto (London, 1866) on the Geographical Distribution of Mammals, illustrated by 101 colored maps; and J. Palacky has done the same for Birds (1885) and for Fishes (1891).

Incidentally, J.A.Palmen wrote a controversial work entitled Ueber die Zugstrassen der Vögel (1876) which was attacked by von Homeyer. During the discussion some light was thrown upon most points on both the migration and distribution of bird-life. Shortly before this date Eugène Rey wrote his Synonymik, 1872, on practically the same subject.

One of numerous articles on local zoogeography is E.D.Cope's Geographical Distribution of Batrachia and Reptilia in North America.

In 1882 and 1892 M.A.Menzbir published (in Russian) his illustrated Ornithologic geography of European Russia. Earlier still another observer, A.T. von Middendorf, published (1859) an account of the seasonal flights of Russian birds.

A. Heilprin's Geographical and Geological Distribution of Animals, ~~[illegible] and~~ which, with a colored map (1887), gives an excellent idea of faunal zoogeography., A different view will be found in R.F.Scharf's History of the European Fauna, 1928.

R. Lydekker has written on the distribution of game animals throughout the world. See, e.g., his Great and Small Game, ~~etc.~~ 1901.

George P. Moore's study (1879) of the geographical range of 376 avian species of British Birds is of great interest.

A comprehensive study of faunal distribution is W.L. and P.L. Sclater's The Geography of Mammals, 1899.

Closely related to zoogeography is the important subject — the migration of animals (in particular the far and wide wanderings of birds) about which so much has been written from the earliest to the present times. This fascinating study is considered in almost all general zoological treatises and in numerous monographs, a few of which are mentioned here. An enlightening work, among many, is that of E.F. von Homeyer, Die Wanderungen der Vögel mit Rücksicht auf die Züge der Säugethiere, Fische und Insecten, 1881, while the latest theories as to bird migration are fully discussed by Alex. Wetmore in his Migration of Birds, Cambridge, Mass., 1927. A very good account of European bird migration is published by Otto Herman in his Recensio critica, 1904.

Wells W. Cooke has written and published, mostly through the Bulletins of the Department of Agriculture, U.S.A., (1910-15) several very valuable monographs on avian zoogeography and migration throughout the United States in its relation, also, to migration in general.

¶ Among ecologists are C.G.J.Peterson (b.1860) who has investigated and reported on the animal life inhabiting the bays and inlets of his native Denmark; J. Schmidt (b.1877) the authority upon the reproduction and life habits of that vertebrate mystery the eel. In like manner Karl Semper (1832-1893), professor at Würzburg, has reported upon the life conditions and distribution of many animals and their particular environments.

The teaching of comparative biology is now commonplace, but it was not when A.A.Gould and Louis Agassiz published the first edition of their Outlines of Physiology in 1855.

Among ~~the~~ paleontologists with vertebrate zoological leanings was the celebrated American, Edward D. Cope (1840-1897), who did such yeoman service in the cause of zoological science, most of it recorded in Smithsonian and ~~other~~ State ~~and United States~~ Departmental literature. Of these ~~one may here mention a few~~ several are mentioned elsewhere but one may recall his ~~Check-List of North American Batrachia and Reptilia, 1875; Catalogue of Batrachians and Reptiles of Central America and Mexico, 1887; The Batrachia and North America, 1889; Crocodilians of North America, 1900;~~ Synopsis of Extinct Reptilia ... of New Jersey, 1868, and ~~Fossil~~ his editorial labors on the American Naturalist. Dr. Cope especially encouraged collaboration with other writers and a list of several conjoint titles will be found in this Catalogue.

Among the readable works on faunal paleontology are the Manual of Lydekker and Nicholson, 3rd. edition, 1889; Christian Meyer's Zur Fauna der Vorwelt, in 4 vols., 1845-60, and, to jump across the Atlantic, the series of articles on Fossil Vertebrates extracted from the Bulletins of the American Museum of Natural History, the first volume of which was published in 1898.

One of the best modern text-books on paleontology is Johann H. Steimann's Einführung, whose second edition was issued in 1907.

Paleontology is exhaustively treated, also, in [redacted] Stromer von Reichenbach's two-volume Lehrbuch, 1909-12.

Another excellent manual is A.S.Woodward's Outlines of Vertebrate Paleontology, 1898. The other captions of this noted paleontologist should also be looked up in the present Catalogue.

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A excellent and reliable popular life history of [redacted] extinct fauna is K.A.von Zittel's Aus der Uhrzeit, 1871-72. Von Zittel has also written an excellent Handbuch der Palāon-tologie, 1896-1902, with English translations from the original German amended by numerous collaborators and continued as a series of monographs until the present time. Altogether it is the most comprehensive, [redacted] modern cyclopedia of extinct and fossil fauna so far attempted.

H.A.Nicholson (alone) has also given us an admirable and popular Manual of Zoology (seventh edition, 1887).

Within the province of vertebrate zoology the records of experimental morphology are not voluminous; plant life seems to be a more fertile field for the investigator. Still, we have the descriptions of August Rauber (1842-1917) who in his experiments with the vertebrate embryo sought to discover the laws that govern its development. Among numerous monographs he wrote Ueber die Stellung des Hühnchens im Entwicklungsplan, 1876.

The founder of this school of evolutionary physiology was Wilhelm Roux (1850-1924) born in Jena. He held professional chairs at Innsbruck and Halle and worked assiduously to popularize his novel methods of zoological experimentation. His Collected Essays appeared in Leipzig, 1895.

Many of these biological experiments appear weird to one unacquahted with advanced laboratory methods but their value is unquestionable. One of the best known experimental morphologists of the day is Hans Spemann of Stuttgart (b.1869), who has held several professional chairs in German universities. The reports of his work are mostly contributed to periodicals.

Finally, let us not forget Jacques Loeb (1859-1914), graduate in medicine and privat docent at Würzburg, professor in Chicago University, and for several years attached to the Rockefeller Institute, who ~~carried on~~ made many chemical and other remarkable experiments on the embryo. Frogs and sea-urchins were the chief material on which these experiments were carried on. An important work by Loeb is The Mechanistic Conception of Life. Yves Delage (1854-1920) reached results similar to those attained by Loeb but by different methods.

Several works on vertebrate embryology have already been mentioned. To these may be added T.L.W.Bischoff's volumes, 1852, the titles listed in this Catalogue and on the cards of the Medical and Osler Libraries of McGill.

A treatise worth consulting is H.M.Rathke's Entwickelungsgeschichte der Wirbelthiere, 1861, that furnishes a good history of faunal embryology as known in the late fifties.

Until the middle of the nineteenth century animal psychology was far from an exact science. Writers in the past either attributed purely human concepts to animals or they, like Descartes, regarded them as mere automatons. Although it is not the purpose of this Introduction to go very deeply into the subject, it is proper to direct attention to the writings of Theodor Fechner (1801-1887) and Wilhelm Wundt (1832-1920). The latter wrote, among other contributions to the subject, Vorlesungen ueber ... die Tierseele, Hamburg, 1892. Several English and French writers have also contributed to the literature of comparative psychology.

The experimental side ~~of animal psychology~~ is discussed by Alfred Lehmann (1858-1921), professor at Copenhagen, who holds that the chief consideration in comparative psychology is the extent to which the organs of the lower animals resemble those of man. He is best known by his Grundzüge der Psycho-physiologie, 1912.

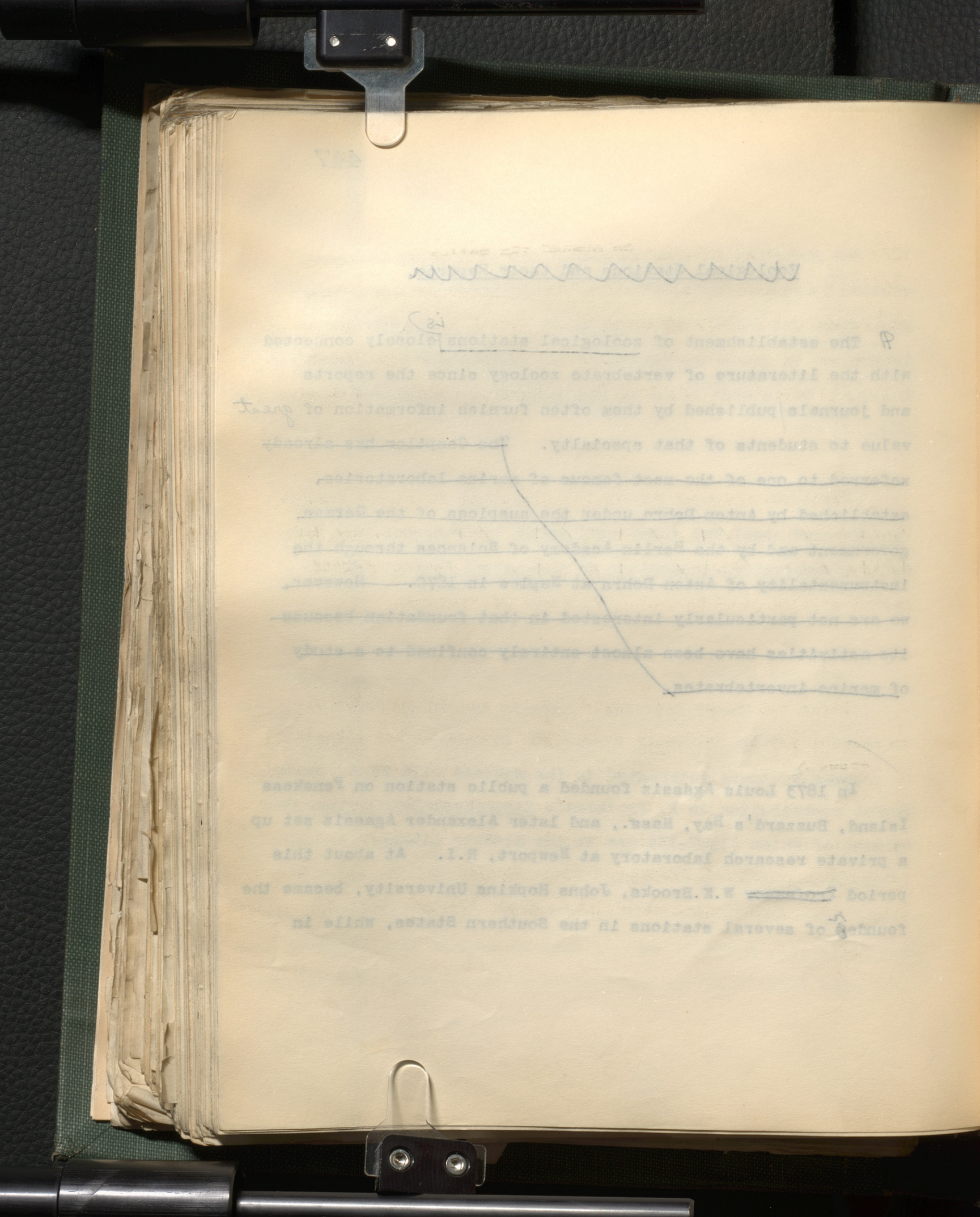
Volumes apart are those written by the Thayers, A.H. and G.H., on Concealing-Coloration in the Animal Kingdom.

~~These~~ Students interested in the subject will find a most useful contribution in H. Przibram's Experimental-Zoologie, four volumes of which (1907-13) are in the Blacker Library.

~~Zoological Stations and their Reports.~~

A The establishment of zoological stations is closely connected with the literature of vertebrate zoology since the reports and journals published by them often furnish information of great value to students of that specialty. ~~The Compiler has already referred to one of the most famous of marine laboratories, established by Anton Dohrn under the auspices of the German government and by the Berlin Academy of Sciences through the instrumentality of Anton Dohrn at Naples in 1870. However, we are not particularly interested in that foundation because its activities have been almost entirely confined to a study of marine invertebrates.~~

In 1873 Louis Agassiz founded a public station on Penekese Island, Buzzard's Bay, Mass., and later Alexander Agassiz set up a private research laboratory at Newport, R.I. At about this period ~~Professor~~ W.K.Brooks, Johns Hopkins University, became the founder of several stations in the Southern States, while in



1889 the U.S.Fish Commission opened its well-known research station in Beaufort, N.C. This was followed by the Marine Biological Laboratory at Woods Hole, Mass., the large marine laboratory of the Brooklyn Institute at Cold Springs Harbor, L.I., and the U.S. Tortugas Zoological Laboratory under A.G.Mayer. ¶ A very useful Biological Station for Research is maintained in Bermuda by Harvard University, published reports of which appear from time to time.

¶ ~~Meantime~~ Stanford University has opened an important ~~extremely useful~~ research and teaching station at Pacific Grove, Monterey Bay, Calif., and the University of California an equally famous marine station near La Jolla, Southern California.

Among numerous other (fresh-water) zoological stations in America may be mentioned - as contributors to the literature of vertebrate zoology - the Illinois State Laboratory of Natural History at Havana, Ill., the station of Indiana University at Winona Lake, the U.S. station at Put-in-Bay, Lake Erie, and the laboratory-station at Sandusky, Ohio, founded by the State University. Of considerable importance, also, was the tropical station

(now unfortunately abandoned) of the N.Y.Zoological Society under the care of C.W.Beebe, located 50 miles up the Essequibo River in British Guiana, and first utilized in 1915. The Compiler spent a winter there and can testify to its valuable activities.

¶ Several useful laboratories and stations have been founded by various Canadian activities. Prominent among these is the Marine Station at Nanaimo, B.C.

¶ Still better situated, perhaps, especially for the study of Central American fauna is the U.S.Sanctuary at Barro Colorado in the Canal Zone. The London Times (Literary Supplement, March 13th. 1930) thus describes it in a review of Frank M. Chapman's My Tropical Air Castle, 1930 :-

"When the Gatun Dam was finally closed in the building of the Panama Canal, the Chagres river flodded about 165 miles of lowland and made islands ~~of~~ the hills; and the largest of these islands is Barro Colorado, roughly circular in shape and with a diameter of about three miles. In 1923 this island-hill was made a nature reserve by the Governor of the Canal Zone and was placed in charge of the Institute for Research in Tropical America, which is a branch of the American Government's National Research Council. Here, with the lavishness which the American Government is able to afford, there has been established a laboratory for the study of the fauna and flora of the region which comes enviably near to the ideal. In comfortable quarters specialists in various branches of biology live at their ease in a excellent climate where malaria is unknown, 450 feet above the level of the lake, with the unbroken primeval forest as their

backyard, and unlimited ice and other luxuries punctually delivered to them from steamers passing through the Canal. If the world so far has heard little of Barro Colorado, it can hardly fail to hear very much more. As Dr. Chapman rather quaintly puts it, it is "on the threshold of what should be an increasingly important existence." It is probable that, as the floods slowly rose, the wild things would retreat into the safety of the highground; so Barro Colorado may have more than its natural stock of birds and beasts. Dr. Chapman catalogues some 230 species of bird which have already been observed; and the three-mile area seems to contain, with the single exception of the jaguar, all the larger mammals of tropical America, including puma, ocelot, tapir, two kinds of peccary and two of deer, four monkeys, two sloths, tayra, agouti, coati, etc. Flashlight photographs of most of these, self-taken by the use of trip-wires stretched across the trails or in other likely places, are an attractive feature of this volume. But Dr. Chapman is primarily an ornithologist and he has studied closely and tells interestingly of the nesting habits of the oropendolas, or American orioles, and the grackles and fly-catchers which are

parasitic on them by nest-robbery; of the mating of parrots, the pluck and fighting qualities of humming birds and of the coloration of forest species and of the purple gallinule and jacana of the open sunlight. His experiments come near to proving that, among vultures, the so-called turkey-buzzard is guided to its food by scent much more than is generally supposed. He also gives the pathetic story of ~~the~~ an attempt to tame a young of the notoriously untamable "howler" monkey, the old men of which have faces which are 'the incarnation of every evil thought that has ever passed through the mind of man' ".

In the development of economic ichthyology ~~both Europe~~ not only the United States and Canada but Great Britain and her colonies have established special laboratories for the study of piscine life and culture. Here may be mentioned the valuable Liverpool Sea-fisheries Laboratory. Many of these issue Reports etc.

¶ In Europe, also, many governments and societies have established schools, obsefvation stations and laboratories for zoological observation and research. Among them Germany and Northern Europe, at Helgoland; ~~Coste in Brittany~~ at Rossitten; Plon (founded 1892); at Kiel; on islands in the White Sea; at Kielkond; Oesel, founded 1909; at Tromsö, Norway; at Copenhagen; and at St. Andrews (Scotland). Further south we find laboratories developed at Plymouth; on the Isle of Man; In France there are stations at Coste in Brittany; at Wimereux; at Cette (Montpellier); at Saint-Vaast-le-Hogue; at Finistère (Roscoff); at Villefranche on the Riviera; In Italy there is a ~~the~~ University Station at Naples; an Austrian station at Trieste; a Russian zoological station at Sebastopol; and at many other European points not mentionable here. These institutions contribute more or less to ~~journals~~ reports and other records on vertebrate fauna, works whose titles will be found in the body of the present Catalogue.

In Europe, also, many governments and societies have established schools, observation stations and laboratories for zoological observation and research. Among them Germany and Northern Europe, at Helgoland; Gruto in Britany; at Rosaitten; Plon (founded 1892); at Kiel; on islands in the White Sea; at Kielkond; Oesel, founded 1909; at Tromso, Norway; at Copenhagen; and at St. Andrews (Scotland). Further south we find laboratories developed at Plymouth; on the Isle of Man; In France stations at Cette in Brittany; at Wimereux; at Cette (Montpellier); at Saint-Vaast-la-Hogue; at Finistère (Roscoff); at Villefranche on the Riviere; the University Station at Naples; an Austrian station at Trieste; a Russian zoological station at Sebastopol; and at many other points not mentionable here. These institutions contribute more or less to journals and other records on vertebrate fauna, works whose titles will be found in the body of the present Catalogue.

Lack of space permits the listing here of only a small number of the many European Museums of Natural History and of their publications - and the same may be said of similar institutions in America and elsewhere - but their literary output, so far as they touch vertebrate Zoology, will be found in the appended Catalogue.

A useful guide to most North American institutions of this kind is F.J.H.Merrill's Natural History Museums of the United States and Canada, 1903.

Federal, Municipal, private and other Museums furnish their quota of literary material in vertebrate zoology. A number of these have been noted. Just here the Compiler draws attention to the admirable and useful publications issued by the Indian Museum of Calcutta, dating from 1881. These are all entered in the present Catalogue.

An admirable Natural History Museum, organized mainly by the late Herbert Robinson, ~~and~~ publishing the Federated Malay States Journal (Kuala Lampar, 1905 to date), furnishes ~~an~~ a typical example of many institutions of the kind in the Far East.

Another active institution is the Capetown South African Museum, publishing its Reports and Annals since 1856.

To the long list of American Museums largely devoted to vertebrate zoology and its literature belong the well-known Museum of Comparative Zoology (Harvard University) that since 1861 has issued a series of important periodicals, among them its Bulletin published from 1863 onwards. ¶ The many Zoological Publications of the Smithsonian Institution, of the Philadelphia Academy of Sciences, the Museum of Vertebrate Zoology, University of California, and other American institutions of this kind will be found listed in the ...ded Catalogue ¶ The numerous publications of the New York American Museum of Natural History (founded in 1860) began with the Annual Report in 1870, since when the wonderful growth of the institution has produced much valuable periodical literature, listed in this Catalogue; and the same may be said of the N.Y.Zoological Society founded in 1895.

Of the several works devoted to the management of museums and zoological gardens in general (including the preparation of objects for the former) that of P.L.Martin, Die Praxis der Naturgeschichte, Weimer, 1869-82 is to be recommended.

¶ The literature, generally annual reports, on vertebrates confined ~~to~~ in menageries, zoological gardens and private collections, can have only a passing ~~mention~~ reference, although it is occasionally of importance. Confined animals furnish valuable information in comparative biology, especially in animal pathology, anatomy, physiology and psychology - not to speak of classification, but ecological notes of caged fauna must always be viewed with some distrust ~~as~~ since birds and beasts do not always behave in captivity as is their wont in the jungle.

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Chapter XV.

Important

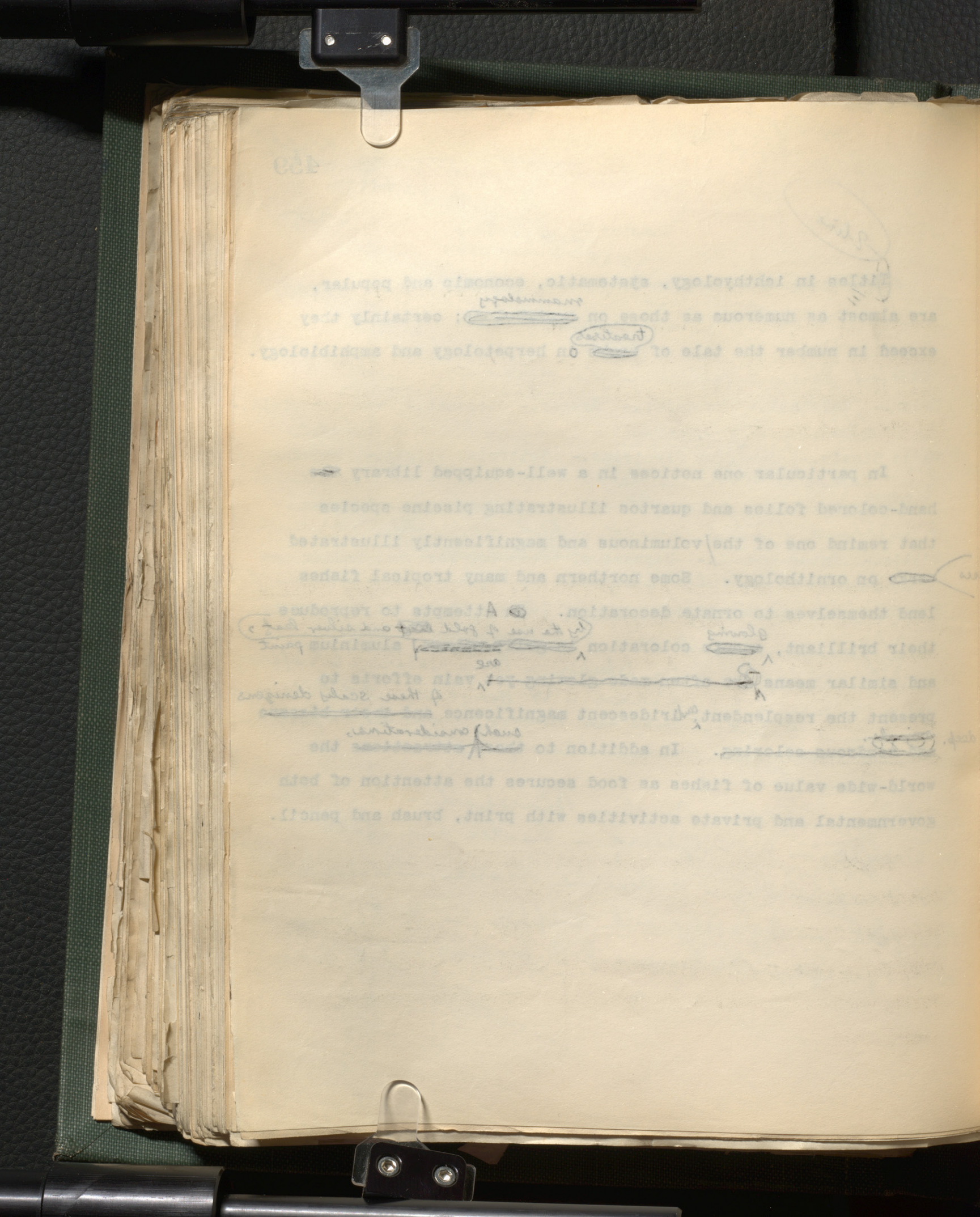
Caps. ~~A Few Early~~ Treatises on Ichthyology ~~and Comparative Anatomy~~.
from the Earliest Times to the Present.

Bashford Dean.— Oppian.— The Kerns.—
Belon.- Salviani.- Rondelet.- Gesner.- Bossuet.- von Schonfeld.-
Sonnini.— Donovan.— Seeley.— Marcus Bloch.—
Paolo Giovio.- Georgius Fabricius.- Gottfried Voight.- ~~Voltelini~~
A. Günther.— Goode and Bean.— Aclogue.— U.S. Expeditions.—
~~Cuvier.— Fabricius ab Aquapendente.— M.A.Severinus.— Thomas~~
A. Guichenet.— Julian Woods.— E. R. Waite.— D.H. Storer.—
~~Willis.— Peter Rommel.— Voyages of Frederick Martens, Bosmar and~~
G. D. Stead.— T. N. Gill.— Evermann.— Eigenmann.— David
~~Hans Sloane.— Comparative~~ Anatomy of Geraard Blaes and Valent~~ini.~~
Starr Jordan.— L. Vaillant.— G. A. Boulenger.— H. Sauvage.—
A. Valenciennes.— Pieter Bleeker.— Max Weber.— E. Geoffroy
Saint-Hilaire.— S. J. Hickson.— W. Houghton.— F. G. Aflalo.—
Evermann.— Gilbert.— Goode and Bean.— Murray and Hjort.—
~~Note Added titles from Bashford Dean.~~
~~+ Cat. Br. Mus.~~.

Houghton.— Siebold.— Couch.— Blanchard.— W. Grote.—
W. Wright.— W. Lilljeborg.— Reuter and Mela.—
B. F. Fried.— Day.— Hutton and Hector.— Weber and
Beaufort.— Agassiz.— A. Griffin.— F. Supino.—
W. P. Pycraft.— Bertram.— J. T. Jenkins.— G. B. Goode.

Titles in ichthyology, systematic, economic and popular, are almost as numerous as those on mammalogy; certainly they exceed in number the tale of treatises on herpetology and amphibiology.

In particular one notices in a well-equipped library hand-colored folios and quartos illustrating piscine species that remind one of the voluminous and magnificently illustrated plates on ornithology. Some northern and many tropical fishes lend themselves to ornate decoration. Attempts to reproduce their brilliant, glowing coloration by the use of gold and silver leaf, aluminium paint and similar means are vain efforts to present the resplendent and iridescent magnificence of these scaly denizens of the deep. In addition to such considerations, the world-wide value of fishes as food secures the attention of both governmental and private activities with print, brush and pencil.



Only a few of the very large number of ichthyologic works shelved in the McGill libraries can be mentioned here, but the attention of the student is called to the chief authorities on this important subject, especially to the complete Bibliography of Fishes by Bashford Dean and his collaborators. The student should have this model annotated catalogue constantly in front of him.

¶ Inasmuch as many valuable accounts of fishes from various parts of the world - particularly pelasgic species - are to be found in the records of Voyages, - numerous examples of which are given in this Catalogue under United States headings.

Ancient literature has occasionally something to say worth repeating about the natural history of fishes. The English translation of Oppian's Greek poem (See Oppian's Halieuticks of the Natureof Fishes and Fishing of the ancients in V books, Oxford, 1722) pretty well sums up all that was really known about Greco-Roman ichthyology. The rarer editions of Oppian, including the unique 1508 printing, are in the McGill collections.

Of the early treatises on ichthyology, Belon's well.known (French) monograph appeared at Paris in 1551. Two years later he published in Latin his chief work on Fishes, a French edition of which appeared in 1555. Belon's treatises were actually the first works on the subject that one may take seriously. They are genuine contributions to ichthyology and mark a decided advance over the former writings on the subject.

Hippolyte Salviani (1514-1572), Roman physician to several popes, wrote his Aquatilium animalium historiae in 1554-58, a folio that was probably not compiled from Belon and, in consequence, lacks many of the scientific features of Belon's monumental treatise. Nevertheless, it forms one of the outstanding ~~era~~ early contributions to systematic ichthyology.

Another important - perhaps the most important - ichthyologist of the sixteenth century was Guillaume Rondelet, another medical man, born in 1507, who described with great care and accuracy more varieties of Fishes than either Belon or Salviani. His masterpieces, Liber de Piscibus, etc., 1554 and Universae aquatilium Historiae, etc. 1555 (both folios) appeared four years before the versatile Gesner published his Ichthyologia, in which, by the way, much of Rondelet's observations are included.

In all he catalogued and described 205 oceanic and 59 freshwater species. of the total 264 239 are figured by woodcuts.

In 1558 F. Bossuet wrote a sort of supplement to Rondelet, entitled De natura aquatilium carmen in universam Gul. R. etc., Leyden.

Another physician, Stephen von Schonfeld of Hamburg, wrote in 1624 an important Ichthyologia, describing the fishes of his locality.

In addition to the many piscine volumes written by sixteenth century doctors of medicine there were a few non-professinnal authors, among them Paolo Giovio who described (De romanis piscibus libellus, 1524-27) Roman fishes. His small work passed through several editions and was translated into Italian by C. Zancaruolo of Venice in 1560.

In passing, mention must be made of Georgius Fabricius, who wrote Fishes of the Elbe; of the Kerns (father and son) and ~~especially~~ of Gottfried Voight who in 1667 published at Wittenberg his dissertation De Piscibus fossilibus atque volatilibus.

From the last-named title it will be seen that animal fossils early attracted attention; indeed their origin was commonly discussed by naturalists ~~writers~~ of the Middle Ages, most of whom agreed without a shadow of doubt that they were plantés là by a wise Creator for his own inscrutable purposes.

Félix Plater (Observations, Basel, 1680) regarded the bones of a mammoth or aurochs found near Lucern as those of a giant, but Ferrante Imperato (Historia naturale, 1599), illustrated his work with drawings of fossils that he correctly surmised - as did others - that they had been deposited in mountains that had risen from the primitive ocean. This Introduction does not pretend, however, to enter, except occasionally, into the fascinating field of ~~zoology~~ piscine paleontology.

One of the most important of the Buffon "suites" is that by T.S.Sonnini, the Histoire naturelle, générale et particulière des Poissons, 1802-05, Paris, in 14 volumes. It is admirably illustrated by colored plates and is regarded as a classic by systematists.

Reference has already been made to the zoological works of Edward Donovan (1768-1837), and one must not forget his valuable and extensive Natural History of British Fishes, in 5 vols., with col. pl., London, 1802-08.

A noteworthy and comparatively early treatise is Wm. Yarrell's History of British Fishes, in two volumes, 1835-36, followed two editions in 1841 and 1859.

¶ Another important ichthyologic treatise is H.G.Seeley's Freshwater Fishes of Europe, 1886.

An early systematic treatise on fishes is P.M.A.Broussonet's Ichthyologia sistens Piscium descriptiones et icones with plates, a quarto issued in London about 1782.

A noted ichthyologist of the late eighteenth century was Marcus Bloch (1723-99) whose classic treatise on German and foreign fishes (Naturgesch. der ausländische Fische, 1785-95) appeared as part of his voluminous Allgemeine Naturgeschichte der Fische, Beautifully illustrated.

As a model presentation of such subjects one should read the Fish of the Voyage of the Beagle, by L. Jenyns.

Practically every scientific oceanic expedition investigated fishes, a typical example being the report by L. Vaillant on the icythyology of the Mission du Cap Horn, 1888; the account given of deep sea fishes by A. Günther in the Report of the Challenger Expedition; the record, by A. Valenciennes, of the fishes during the world cruises of the "Vénus", "Bonite", "Favorite", and ~~other~~ similar French ~~several~~ scientific expeditions.

Reference has several times been made to that monumental work, an annotated Bibliography of Fishes (1916-23), in three volunes, the joint work of three accomplished ichthyologists, the most important (contributor) being the first author, ~~and most important contributor~~ Bashford Dean. Every serious student of piscine life and every natural history library should be en rapport with this almost unique production. (George B. Goode and T. H. Bean) Two Americans collaborated to produce a monograph, in two volumes, on Oceanic Ichthyology, well illustrated by 123 plates. A rare treatise is (J. V. E.) Smith's Natural History of the Fishes of Massachusetts, published in Boston.

A good, recent account of French ichthyology is given by A. Aclogue in his Faune de France, 1900.

As previously stated, ~~In much the same way~~ the ~~Government~~ Federal government ~~and the various departments~~ of the United States ~~have~~ has from time to time despatched expeditions that secured large collections of vertebrates, including fishes, many reports of which are listed and annotated in the present Catalogue, chiefly under the heading United States, ~~and similar captions.~~ Among these are ~~reports~~ accounts by well-known zoologists of the cruise of the ~~Corwin~~ "Corwin" to Alaska and the N.W.Arctic Ocean in 1881; the International Polar Expedition to Pt. Barrow, Alaska, etc., 1885; Exploration of the Valley of the Amazon, 1853-54; U.S. and Mexican Boundary Survey, 1857-59; the U.S.Naval ... Expedition to the Southern Seas, 1855; Expedition down the Zuni and Colorado Rivers, 1853; Pacific Railway Survey, 1855-59, and a dozen others in which the ichthyology of the ~~cruise~~ expeditions was more or less completely treated.

~~It seems hardly necessary to~~ One must draw attention to the admirable review of American ichthyology ~~contained~~ in Fisheries and Fishery Industries of the United States, (1884-87), edited by G.B.Goode.

The fishes and reptiles of Chile are described and pictured by A. Guichenet in Claude Gay's excellent Historia de Chile, 1848-49.

In 1882 Julian Woods described the Fish and Fisheries of New South Wales, followed by E.R.Waite who wrote the Marine Fish of New South Wales in 1898.

G.D.Stead has written a report on the Edible Fishes of New South Wales, 1908, ~~with~~ illustrated by 81 plates and a colored map, a supplement to his more important Fishes of Australia, 1906.

An early and important New England ichthyologist was David H. Storer (1804-1891) whose reports on the fishes and reptiles of Massachusetts (1839) and his Synopsis of the Fishes of North America (1846) are well known to systematists.

Of the numerous contributions by T.N.Gill to American ichthyology his Catalogue of the Fishes of the Eastern Coast, 1873, and his contribution to Kingsley's Standard Natural History (1885) may be mentioned. Another American work of value is Girard's Ichthyology of the (Mexican) Boundary, illustrated by 41 plates, 1859.

A book, both popular and scientific, is C.Z.Southard's American Trout, 1928.

Here may also be noted Kilbourne and Goode's Game Fishes of the United States, (1879,) with 20 colored plates.

The fishes of Peru are described and depicted in J.J.von Tschudi's Fauna Peruana, 1844-46.

Evermann and Radcliffe have also written on the Fishes of the West Coast of Peru, a work illustrated by 14 colored plates, 1917, (U.S.Nat. Mus. Bull. 95). A S.E. Meek's well known Freshwater Fishes of Mexico was published in 1904, and C.T. Regan in 1906 contributed his section on Pisces to the Biologia Centrali-Americana, in which many Mexican species are described.

That well-known authority on American ichthyology, Carl H. Eigenmann (1863-) has written extensively on the fishes of South America; for example, his Freshwater Fishes of British Guiana, an elaborate report published as a Memoir by the Carnegie Institute (Pittsburgh) in 1912. Other titles of Dr. Eigenmann appear in the present Catalogue.

The fishes of North Borneo are described (in Whitehead's Exploration, 1893) by L. Vaillant, as are the marine and freshwater fishes of Malaysia by J. Johnstone and G.A.Boulenger. See Fasciculi Malayenses, 1903.

Madagascar is well represented in ichthyologic literature by H. Sauvage's classic contribution to A. Grandidier's Histoire physique, 1875-1900, of that island. Zanzibar was similarly treated (1866) by R.L.Playfair and A.C.L.G.Günther, with the aid of 21 colored plates.

R.T.Lowe's Fishes of Madeira, 1843-60, with 17 colored plates, should also be borne in mind.

The ichthyology of the Canary Islands was described by A. Valenciennes in 1836-44,

As one of a series published by Stanford University, E.C.Starke gives an account (1913) of the Fishes of the Stanford Expedition to Brazil.

Among accounts of local African fishes is the description of the catch made during the progress of the Mission Chari-Lac Tchad, 1902-04, under Auguste Chevalier. In the appendix the ichthyology of the expedition is treated by J. Pellegrin.

Between 1862-78 the celebrated Dutch ichthyologist, Pieter Bleeker, was engaged in bringing out his famous Atlas Ichthyologique, in nine folio volumes, whose splendid colored plates picture the fishes of the Netherland East Indies.

The freshwater fishes of the Indian Archipelago are carefully described by Max Weber in Zoologische Ergebnisse, 1894. He also wrote a similar account for Wichmann's Nova Guinea, 1906.
¶ A standard work of reference is David S. Jordan's Catalogue of the Fishes of Japan, 1913.

early as 1803 there appeared a description by Patrick Russell of 200 species (and colored figures) of Indian fishes collected along the coast of Coromandel.

The student of East Indian ichthyology should not neglect the several descriptive catalogues issued by the Calcutta Indian Museum - especially those by A. Alcock.

Mention might here be made to a useful work, illustrated, Buchanan's Fishes of the River Ganges, 1822.

[redacted] E. Geoffrey Saint-Hilaire (Description de l'Egypt, 1809-30) wrote ~~his~~ a Histoire naturelle des Poissons du Nil, de la Mer Rouge et de la Méditerranée. It may here be added that E. Rüppell also wrote (1828) an illuminating account of Red Sea fishes, illustrated by 35 colored plates.

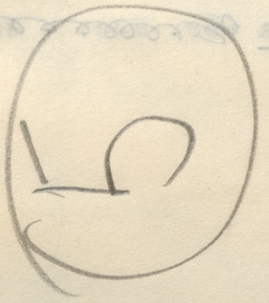
In 1913 C. Alluaud described the fishes collected from Lake Victoria Nyanza.

In 1902 G.A.Boulenger wrote a well-illustrated work on the fishes of the Nile, and in 1907 contributed a list of the fishes in the River Gambia, West Africa.

A useful book for the advanced student is G.A.Boulenger's Catalogue of the Freshwater Fishes of Africa in four illustrated volumes, 1909-16.

Among the most famous of the world's herpetologists and ichthyologists stands A.C.L.G.Günther, a few of whose works have already been mentioned. His numerous contributions to the literature on reptiles and fishes of the British Museum are well-known, and many of them listed in the appended Catalogue.

Of quite another class, though a very interesting one, is S.J.Hickson's Fauna of the Deep-Sea, 1894. To the same category belongs E.W.H.Holdsworth's Sea Fisheries, London, 1877.



Among the earlier works on the subject, an important treatise is William Yarrell's History of British Fishes, 1836, with several subsequent editions.

Although of local importance only and one of many such books, W.Houghton's two-volumes on British Fresh Water Fishes, 1879, give a very interesting and accurate account of the subject. The same may be said of a handsome, illustrated work with the same title by Sir Herbert Maxwell, 1904, one of the Woburn Library Series. In 1918, Neal Green brought out his instructive work on the Fisheries of the North Sea.

F.G.Aflalo has also contributed a volume (on British Salt-Water Fishes, 1904) to the Woburn Library.

The most important nineteenth century French treatise on fishes in general is the extensive work of Cuvier and Valenciennes, published 1828-49, the Histoire naturelle des Poissons, 22 vols., Paris. Ten years later there appeared the first portion of the celebrated Catalogue of Fishes in the British Museum, London, 1859-70, by A. Günther, who in 1880 also wrote a useful and practical handbook, an Introduction to the Study of Fishes, Edinburgh. Still later there appeared several noteworthy contributions to ichthyology, among them, Eigenmann's South American Fishes, San Francisco, 1893, and Dean's Fishes, Living and Fossil, N.Y. 1895.

These treatises were followed by one of our most extensive systematic monographs, Jordan and Evermann's Fishes of North and Middle America in 4 vols., 1896-1900, Washington. Dr. David Starr Jordan, who is easily the best known authority on ichthyology in America, if not in the world, is the author of many works on that subject, among them a semipopular volume, Fishes, 1907, N.Y. This veteran ichthyologist's best known systematic monograph is his Genera of

Fishes issued 1917-20 in four parts, each separately indexed. This "contribution to the stability of scientific nomenclature" records the history, bibliography, synonymy, etc. of ichthyology from Linnaeus (1758) to 1920.

It was Boulenger who contributed an excellent essay on fishes in general to Vol. VII of the Cambridge Natural History series. Three American authors about this time also published books that deserve special mention here - Ward's Marvels of Fish Life, N.Y., 1912, and Goode and Bean's Oceanic Ichthyology, N.Y. 1915, Goode already (in 1888) having written on American Fishes, N.Y.

¶ Another important, general treatise (on deep-sea ichthyology) is Murray and Hjort's Depths of the Ocean, 1912.

¶ Of the remarkable types found in Oceania and neighboring waters D.S. Jordan and A. Seale described in 1906 The Fishes of Samoa; A. Günther ¶ Die Fische der Südsee (1873-1910) ¶ and D.S. Jordan and B.W. Evermann, Fishes of the Hawaiian Islands, 1905. The american titles are mostly U.S. Government publications

¶ Turning once more to ~~[illegible]~~ works on foreign and fossil ichthyology we note Houghton's (1879) Freshwater Fishes of Great Britain, London; Siebold's (1863) Die Süsswasserfische von Mitteleuropa, Leipzig; Couch's Fishes of Great Britain; Süsswasserfauna Deutschlands of Brauer, 1909; Blanchard, (1866) Les Poissons des eaux douces de la France, Paris; and W. Grote's Süsswasserfische von Mittel-Europa, Frankfurt, 1909;

Between 1836-57 appeared the first edition of W. Wright's monumental Skandinaviens fiskar followed in 1892-95 by an edition in English. This treatise is among the best yet written, a beautifully illustrated work on North Sea fishes.

In 1881 was also published an important work on Scandinavian pisces by W. Lilljeborg - Sveriges och Norges fiskar - in three volumes.

An outstanding treatise on the fishes of Finland, in fact the standard work on the subject, is Reuter and Mela's Finlands Fiskar (1883-93, 12 parts so far issued), with the text in both Swedish and English.

Still later (1892-95) is the excellent three-volume monograph of B.F.Fried and others entitled Skandinaviens Fiskar.

Others are Day (1889), Fishes, in Fauna of British India; Hutton and Hector's (1872) Fishes of New Zealand; and a magnificent monograph in five volumes by Weber and Beaufort (1911-28) on the Fishes of the Indo-Australian Archipelago.

Of many works on fossil fishes, Agassiz (1833-44) wrote Recherches sur les poissons fossiles, 3 vols., and supplement, and Newberry (1890) Paleozoic Fishes of North America, Geological Survey, Wash.. Sir Richard Owen also wrote a full account of fossil fishes in 1846.

The celebrated Alphonse Guichenot contributed many useful treatises to this almost universal ichthyology, among them the Reptiles and Fishes of Cuba, 1843; of Chile, 1848; of Abyssinia, 1851, and of Réunion in 1862 - all of these titles being listed in this Catalogue. A useful, systematic, two-volume Catalogue of the Fishes of South Africa was published in 1927 by A. K. Barnard.

Much earlier, A. Valenciennes wrote on the fishes of South America, in the Voyage dans l'Amerique meridionale, 1835-47.

In 1870 J.C. Weber issued the second edition (amended by Kranz) of his small manual, Die Fische Deutschlands u. der Schweiz, illustrated by 67 colored plates.

The Pisces of Siebold's Fauna Japonica (1842-50) furnish one of the best accounts of Japanese ichthyology, although in America D. S. Jordan's Catalogue of the Fishes of Japan, Tokyo, 1913, is a standard authority.

Achille Griffin published in 1911 a popular work on fishes, amphibia and reptiles, well illustrated.

In 1916 appeared Prof. F. Supino's systematic I pesci d'acqua dolce d'Italia, illustrated by colored plates.

Of popular works on general ichthyology the Compiler recommends W.P.Pycraft's Story of Fish-Life, 1901.

For a full account of American fish culture and protection as well as of the uses of fish for food and other commercial purposes the literature supplied by the U.S.Department of Agriculture is recommended.

In Great Britain many volumes have been written on economic ichthyology, one of the popular titles being Bertram's Harvest of the Sea, London, 1865; another, McIntosh and Masterman's British Marine Food Fishes, 1897; ~~Still~~ later a ~~Old~~ valuable monograph by J. T. Jenkins, The Sea Fisheries, 1920.

Probably the most important (English) source of 19th. century literature on fishes in general followed the London meeting in 1883 of the Great International Fisheries ~~Exhibition~~ Exposition. In Vol. III, p.1170 of the Catalogue of the British Museum (Natural History) is published most of the papers contributed to that meeting. The advanced student of New World Ichthyology will look over with profit the list ~~containing~~ of papers by G.B.Goode and other American writers. ~~with profit~~.

~~Herpetology~~ ~~XVI~~ ✓✓ OK. July 7/16/30

CHAPTER ~~XVI~~ 12pt caps #d.

Selected Titles from the Literature of Herpetology and Amphibiology.

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Charles Owen. — von Rosenhof. — J. G. Schneider. — J. D. Schoepf. — Johann Sturm. — Lamouroux and ~~Bory~~ Bory de Saint-Vincent. — W. Swainson. — V. Kollar. — C. Girard. — G. A. Boulenger. — J. E. Gray. — E. D. Cope. — L. Stejeneger. — H. C. Bumpus. — E. Coues. — H. C. Yarrow. — Hans Gadow. — Lydekker. — G. Cuvier. — J. Van Denburgh. — Ditmars. — Reese. — J. E. Holbrook. — D. Humphrey. — S. P. Woodward. — F. A. Lucas. — von Zittel. — De Kay. — W. H. Smith. — Suckley and Cooper. — A. S. Woodward. — Victoria County Histories. — Westell. — Geo. G. Scott. — C. H. G. von Heyden. — R. P. Lesson. — Temminck and Schlegel. — T. Bell. — Guichenot. — Geoffrey Saint-Hilaire. — Vaillant and Grandidier. — F. W. Fitzsimons. — Nieden and Sternfeld. —

Siebenrock and Boettger.– Dürigen.– E. Schreiber.–
A. Günther.– Ramon de la Sagra.– J. E. Gray.– J. L. G.
Krefft.– Gabriel Bibron.– Boucourt and Dumeril.–
J. B. Spix.– L. G. Andersson.– Baron Tschudi.–W. L. Sclater.–
Patrick Russell.– A. Acloque.– J. F. M. Regius.–L. Stejneger.–
Siebold.–F. Moquard.– Rooy and van Kampen.–L. Mehely.–

It may here be noted that the term amphibia was originally employed by Linnaeus to denote the Class of the Animal Kingdom comprising crocodilia, lacertilia, tortoises, turtles, ophidia, salamanders and frogs. Indeed, later editions of his Systema Naturae added to this list certain groups of fishes. Although this view has been greatly modified by later observers and the Compiler, although knowing that Huxley and others insisted upon the distinctness of the Class Amphibia, yet it is much more convenient in the present compilation to adopt the plan of Günther. In his celebrated Catalogue he treats amphibia as one of the four orders of Reptilia; accordingly the Compiler will regard titles on Amphibia as a part of herpetologic literature. In fact they are so treated in many monographs.

Ancient and early medieval literature about reptiles.- especially "serpents"- seems bound up with accounts of animals in general, references to which have already been abundantly made. Most of this primitive discourses, especially on "Serpents", are largely mythical matter, as will be found in Charles Owen's Essay on Snakes, 1748.

Roesel von Rosenhof's Historia naturalis Ranarum, with a preface by A. von Haller, and 24 plates, 1758, is generally regarded as an excellent piece of work and rated among the early classics of amphibiology.

To the same category belongs J.G.Schneider's Naturgeschichte der Schildkröten, 1783, and 2 colored plates, although J.D.Schoepf's Historia Testudinum, 1792, with 34 colored plates, adopts a more modern literary dress.

In 1799-1805 Johann Sturm described and pictured German amphibia in his Deutschlands Fauna. In 1828 Madame S. amourous depicted her Iconographie des Reptiles, with text by de Bory Saint-Vincent.

W. Swainson made a study of monocardian animals (2 vols., 1838-39) in which the Reptiles of the World occupy a prominent place. A useful account of amphibian life is given in V. Kollar's Bildliche Naturgeschichte, 1853-7.

At the outset, attention is again drawn to the many valuable systematic accounts of the reptiles and amphibians of the world in reports of Voyages and scientific Expeditions, both governmental and private. Many of these herpetological titles are noted below the major headings in the Catalogue, and should not be forgotten by the research student. For example, a very elaborate account of American herpetology is given by C. Girard under United States. Voyages, Wilkes Expedition, 1845-76.

¶ The chief systematic English writers (in English) ~~both local and general~~, on reptiles and amphibia, are G.A.Boulenger, J.E.Gray, and A. Günther of the British Museum, ~~and~~ E.D.Cope and L. Stejneger of the Smithsonian Institution, and R.L.Ditmars of the New York Zoological Society. Their works (listed in the accompanying Catalogue) give a good account of the whole subject and should be consulted by all students of this group. ¶ One may begin the modern list by ~~Other treatises of importance including~~ (mentioning) the monographs of ~~the~~ John E. Gray, (with Sowerby and Lear), Tortoises, Terrapins and Turtles, folio, 1872; and L. Stejneger, Herpetology of Porto Rico, 200 ill., 1904. The batrachia and reptilia of the Standard Natural History (see Kingsley, J.S.), 1885 are amply discussed by H.C.Bumpus and E.D. Cope, and in Reptiles of the Great Salt Lake of Utah (see H. Stansbury, 1852.)

A valuable contribution to mid-American herpetology (including amphibia) is furnished by H.C.Yarrow and E. Coues in the Federal Report, Survey West of the Hundredth Meridian, 1875. ¶ Hans Gadow,

Amphibia (Cambridge Natural History, Vol. VIII), 1901; Lydekker and others, Amphibia, London, 1912, and Dickerson's The Frog Book, 1906, N.Y., are ~~important volumes~~ semi-popular works of considerable importance. Valuable contributions to fossil amphibia (as a section of general paleontology) form part of H.R.Knipe's Evolution in the Past, London, 1912.

As has been pointed out, there are many works on general zoology that contain admirable essays on herpetology. One of these is Ehrenberg's Symbolae Physicae whose supplement (1899) has excellent, illustrated chapters on reptiles by G. Tornier.

In Vol. V of Occasional Papers, California Academy of Sciences, 1897, J. Van Denburgh describes the reptilia of the Pacific Coast of North America.

In Vol. V of Occasional Papers, California Academy of Sciences, 1897, J. Van Denburgh describes the reptilia of the Pacific Coast of North America.

Treatises and periodical publications on reptilian and amphibian forms are not as extensive as might from the interest of the subject be expected. However, recent field work on world species has occupied the attention both of systematic paleontologists and pure zoologists; there has in consequence been a great increase in the literary output dealing with prehistoric reptiles. ¶ One of the noteworthy reviews of general amphibiology and herpetology is to be found in F. Werner's editim of Brehm's Tierleben, 1912, under Lurche und Kriechtiere. ¶ A valuable author's excerpt from the American Naturalist (1925) is G. K. Noble's Evolution and Dispersal of Frogs. ¶ One of the best early treatises on British reptiles is Bell's History, 1839. ¶ Of early comprehensive monographs, that of Dumeril and Bibron (Erpétologie générale, 1834-54, Paris) is to be especially recommended. Later, Holbrook (in 1842) published in Philadelphia his well-known North American Herpetology. Another famous work of great local value is Fayrer's Snakes of India. ¶ J. Versluys', on Amphibia, (Vol. I, Handwörterb. d. Naturwiss., 1912) gives a good account of the subject; so does E. Perrier, in his Traité de Zoologie, VII, 1925, while O. Abel in Die Stämme der Wirbeltiere, 1919, deals scientifically with developmental herpetology and amphibiology as part of vertebrate zoology.

also David Humphrey's (1804-1891) Report on the Herpetology and Herpetology of Massachusetts, 1839.

¶ A very important contribution to the literature of modern herpetology is the work of Bronn, 1866, Reptilia, as part of his monumental Klassen und Ordnungen des Thierreichs. Of still greater value for advanced students are Boulenger's Catalogue of the Reptiles in the British Museum, London, 1889-96; Lydekker's companion volume, (1890) Catalogue of the Fossil Reptiles and Amphibia in the British Museum; E.D.Cope's Crocodilians, Lizards and Snakes, Washington, 1900, as well as his (brief) Analytical Table of Genera of Snakes, 1886.

Well written and dependable books of a more popular character are Ditmar's Reptiles of the World, N.Y., 1910 and 1927; the same author's Reptile Book, N.Y., 1914, and Reese's Alligator and its Allies, 1915. To these may be added S.W.Williston's Water Reptiles of the Past and Present, Chicago, 1914, and Boulenger's Reptiles and Batrichians, N.Y., 1915.

¶ Among other (American) writers may be mentioned John Edwards Holbrook (1796-1871) who wrote a well-known North American Herpetology, etc., in 5 vols., with col. ill., 4to. Phila., 1842, and other treatises on (local) reptilia; also David Humphrey's (1804-1891) Report on the Ichthyology and Herpetology of Massachusetts, 1839,

Publications dealing with the extinct and fossil forms, interesting to both zoologists and general readers, are S.P. Woodward's Vertebrate Paleontology, London, 1989; F.A.Lucas' Animals before Man in North America, N.Y., 1903, and K.A. von Zittel's Text Book of Paleontology (Ehglish translation by C.R. Eastman, 2 vols., N.Y., 1903).

Numerous examples of reptilian fossil deposits discovered in Europe ane described in literature, a good example being that the quarto volume of E. Fraas, Stuttgart, 1896, Die Schwäbischen Trias-Saurier. The British Museum publications, especially those of Richard Lydekker, previously mentioned, furnish a complete study of fossil reptilian and amphibian world forms prior to 1890.

Many of the local faunal histories of North America describe the reptiles and amphibia of a particular locality. Perhaps the most elaborate of these is found in De Kay's Natural History of New York State, 1842-44. Another, less valuable but furnishing a report on Mid-West American herpetology and amphibiology (in Ohio), is made by W.H.Smith.

In 1859-60 Suckley and Cooper published their reports, in three parts, of the fauna collected during 1853-60 in Washington and Oregon territories, Minnesota, Nebraska, Kansas, Utah and California. Much of this valuable material was also utilized for other publications, listed in this Catalogue. Part III contains the zoology, of which J.G.Cooper describes the reptiles.

A small volume containing much information on vertebrate paleontology is A. Smith Woodward's Guide to Fossil Reptiles, Amphibians and Fishes, 1910.

The reptiles and amphibia of the British Isles are generously described in various treatises and manuals but especially in county publications, records of ~~societies~~ meetings (Dublin, Sheffield, et al) of the British Association for the Advancement of Science, local natural history periodicals, etc. As an outstanding source of information for the first of these see the Victoria County Histories. There is, however, local faunal accounts ~~a large and an enormous amount of mere compilation~~ ge amount ~~and sublime~~ of duplication.

Several of the Guides to the British Museum (Natural History) deal with amphibia and reptiles in a scientific fashion. Among them is a volume, very useful to the advanced student, by Richard Lydekker, 1913.

A recent, small, popular work on British Reptiles and Amphibia is W.P. Westell's contribution to the Abbey Nature Books, (?) 1927.

For an up-to-date study of the biologic relations of reptiles and amphibia there is no better text-book than George G.Scott's The Science of Biology, 1930, in which the morphology, histology, phylogeny, physiology, classification, etc., of these sub-classes meet the wants of the advanced student.

At this juncture one may refer to G.A.Boulenger's well-known Tailless Batrachians of Europe, 1897, illustrated by 24 colored plates - one of the Ray Society publications.

In 1827 C.H.G. von Hayden wrote an illuminating account of North African reptiles, illustrated with colored plates.

The batrachians and reptiles of Malaysia are well described by G.A.Boulenger in Annandale and Robinson's Fasciculi Malayenses, 1903.

In 1832 R.P.Lesson inscribed the records of herpetology of a Voyage aux Indes-Orientales, a valuable addition to our knowledge of the subject.

In 1833-38 Temminck and Schlegel described the reptiles of Japan as part of Siebold's Fauna Japonica.

In 1842 appeared the Reptiles of the Voyage of the Beagle, an admirable scientific treatise, by T. Bell.

Among other early (and unimportant) contributions to herpetology is the little book by Baron Clermont, A Guide to the Quadrupeds and Reptiles of Europe, 1859.

A noteworthy contribution to the herpetology of North Africa was made by Guichenot in a Voyage en Abyssinie, 1847-51. The same author (with C.H.Jacquinot) described the reptiles and fishes of the voyage to the South Pole of the Astrolabe and la Zelée, 1841-54.

As part of his several contributions to the monumental Description de l'Égypte, 1908-30, E. Geoffrey Saint-Hilaire wrote several sections on the reptilia of the Nile region.

The herpetology of Madagascar is well described by L. Vaillant and G. Grandidier in A. Grandidier's Histoire physique, 1875-1900, of that interesting island.

C.H.G.Heyden's Atlas (1827) of the Reptiles of North Africa forms part of the illustrations of E. Ruppell's Reise.

¶ An excellent monograph on the Snakes of South Africa peared in 1912 from the pen of that noted naturalist, F. W. Fitzsimons.

A quite recent review of the amphibia and reptiles of Central Africa will be found under the caption Adolf Friedrich of Mecklenburg, 1910, by F. Nieden and R. Sternfeld (1912).

The herpetology and amphibiology of the Nile region were well described and pictured in 1898 by John Anderson.

F. Siebenrock and O. Boettger give a good account of the amphibia and reptiles of Madagascar and East Africa in A. Voeltzkow's Reise in Ostafrika, in 1903-05.

P.N.Van Kempen describes the amphibia of the Indian archipelago as collected by Max Weber ~~xxxx~~ in 1890.

The amphibia and reptiles of Middle Europe are well described and depicted by Br. Dürigen under the caption Deutschlands Amphibien und Reptilien, 1897.

Another valuable and systematic treatise, but more comprehensive, is E. Schreiber's Herpetologia Europaea, 1875.

¶ A ~~valuable~~ notable (French) edition of G. A. Boulenger is Les batraciens et principalement ceux d'Europe, 1910.

A good description of local South American amphibians and reptiles is given by G.A.Boulenger in E. Whymper's Travels among the Great Andes, 1891.

The reptilia and amphibia of the Americas are well represented in literature. In addition to titles already quoted one of the best accounts of ~~those~~ Mexican and Central American sub-classes is furnished by A. Günther in Godman and Salvin's Biologia Centrali-Americana, 1879.

A good account of Cuban reptilia is given in Vol. IV of Ramon de la Sagra's Historia fisica, 1843. See, also, under the captions United States in the appended Catalogue, ~~in which~~ where many accounts of American ~~and other~~ reptilia and amphibia are given.

Of the rather sparse literature of Australian herpetological literature mention may be made of J.E.Gray's Catalogue of reptiles and amphibia to be found in Sir George Grey's Journals, published in 1841; also in his and A. Günther's reports on the same in the Voyage of the Erebus and Terror.

The reptiles and amphibia of Central Australia have been systematically dealt with in the Report of W.A.Horn's Scientific Expedition, 1896.

J.L.G. Krefft in 1869 published an admirable essay on the Snakes of Australia. A good account of the reptiles and amphibia of New South Wales is contained in the Handbook of a meeting of the British Association for the Advancement of Science at Sydney in 1914.

The reptiles of South America as ~~[illegible]~~ known at the date of publication (1847) are well described by the naturalist-explorer Gabriel Bibron in his several expeditions, including the famous Voyage dans l'Amerique méridionale (several times referred to here), that of "La Bonite", etc. P. Brocchi has also (1882) published an Étude des Batraciens de l'Amerique Centrale in 4to.

An important paper on the reptiles and batrachia of Mexico was written in 1870 by Bocourt and Dumeril as part of the Mission scientifique au Mexique. J.B.Spix wrote in 1824 a monograph on the Batrachians and Monkeys of Brazil.

~~[illegible]~~ L.G.Anderssnn listed the reptiles and batrachians of southermost South America in 1899-1907, collected by the Swedish Expedition to the lands about the Straits of Magellan.

The reptilia of Peru are pictured and described in Baron Tschudi's Fauna Peruana, 1844-46.

The reptilia and batrachia of India, Burma and Ceylon are well described and depicted by G.A.Boulenger in the classic (Blanford's) Fauna of British India, 1888.

A reference list of the Reptiles and Batrachia in the (Calcutta) Indian Museum by W.L.Sclater will also be found very useful. In 1872 appeared the first edition of Sir Joseph Fayrer's classic Thanatophidia, an interesting account of the poisonous snakes of India.

In 1864, the Ray Society reprinted A. Günther's important Reptiles of British India.

More than half a century earlier Patrick Russell wrote two monographs, well-illustrated, 1796 and 1801, on Indian Serpents.

French amphibia and reptilia are well-described in A. Aclogue's Faune de France, 1900. A A systematic account of the reptiles of Indo-China is given as Decades Zoologiques (1905-7) in the report of the Mission Scientifique, published at Hanöi.

The batrachians and fishes of Southern France have been described by J.F.M.Reguis in his Essai sur l'hisboire naturelle de la Provence, etc., 1882.

The reptilian life of Japan is best described and depicted (in its modern aspect at least) by Siebold in his large and classic Fauna Japonica, and by L. Stejneger's Herpetology of Japan and Adjacent Territory (1907), the latter a profusely illustrated monograph of 577 pages.

The amphibia and reptiles of North Borneo have been fully described by F. Moquard in Whitehead's Exploration, 1893, the same task having been undertaken by N. de Rooy and P.N. van Kampen for Wichmann's systematic travelogue, Nova Guinea, 1906.

A general report on Asiatic amphibia and reptiles was also furnished by L. Méhely from collections made during Zichy's Forschungsreise, 1901.

The reptiles and amphibia of North China are partly described in Clark and Sowerby's report on the Clark Expedition of 1912.

In 1925 began a very important series, entitled Beiträge zur Fauna sinica, the first four parts of which are devoted to a study of Chinese reptiles.

A systematic work, part of Cornalia's Fauna d'Italia, is F.E.de Betta's Rettili ed Anfibi, 4to., 1874.

Still earlier (1777) Cetti wrote his Anfibi e Pesci di Sardegna.

A more recent publication is a small but useful and well-illustrated treatise, Achille Griffin's (first printing in 1911) I pesce - gli anfibi - I rettili, in which the essentials of universal herpetology are briefly discussed.

Along with other vertebrates Bavarian amphibia are fully described in Reider and Hahn's Fauna Boica, 1831.

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~~Oriental Literature~~

~~XVII~~

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CHAPTER XVII.

Oriental Literature on Vertebrate Zoology. ~~Mohammedan Codices~~, Codices, Printed treatises and Lithograms in Persian, Arabic, and other Islamic Languages. Sanskrit and Sinhalese Writings. Chinese and Japanese Literature on Zoology.

Zakariya Qazmini. — Al-Jāhiz. — Nizamu'd-din. — ~~Faras~~ Faras-nama. — 'Ilāju'l-fil. — Damiri. — Uthman Beg. — Raja Rajeswar Rao. — Doki Nandan. — ~~Faras~~ Baz-nama. — ~~Tuhfatu~~ Tuhfatu's-sa'idin. — Tibb-i-aspān. — Chinese books on Zoology. —

References have elsewhere in this volume been made to the rather extensive collections of Arabic, Persian, Sanskrit, Hindustani, Bengali, Sinhalese, Chinese and other oriental works on zoology in the McGill Libraries. These notes and evaluations to be found in the appended Catalogue raisonée are intended to furnish some proof that the Far Eastern peoples were not indifferent to the study and attractions of natural history, and that while oriental literature on that subject is relatively small it does exist. From the roster of Persian, Arabic and Hindustani manuscripts, lithograms and printed books, collected for the Blacker and E.S.W.Libraries during the Compiler's years in India and Kashmir he presents the following :-

'Aja'ibul-maklucat (Wonders of Creation) by Zakariya Qazmini, composed during the XIII century. A Hindustani translation from the Persian or Arabic. Treats of Cosmography and Natural Science, including General Zoology. Lucknow, 1912. Large 4to. Pp. 696. Illustrated in color.

Including this(lithographed)copy, there are in the McGill libraries four other copies or editions of this the best known medieval Mahommedan work on zoology.

¶ A very important and fundamental Book on Animals written in Arabic by al-Jāhiz in the ninth century, from which citations were made by subsequent Islamic writers, including Qazwini, and by some medieval Christian authors. See the annotation of this work in the appended Catalogue.

Aqlu'sh-shu'ur, by Nizamu'd-din, composed about 1873. In Hindi; naturalistic encyclopedia. Lucknow, 1914. Pp. 490.

Danish-nama-i-Ala'i, by Avicenna, beginning XI century. Persian natural philosophy. Haydarabad, 1891. Pp.7+137+176. (Rare publication).

Faras-nama, by Muhammad Abdu'l-lah, end XIX century; in Hindustani; four books, on the horse.

'Ilaju'l-fil, by the same writer; in Hindi; diseases of the elephant. Lucknow, 1912. Pp. 184.

Faras-nama, a different version of the preceding work, in Hindustani, also in four books.

Ilaju'l-fil, also a different version of the same title, supra. Lucknow, 1899. Pp.199.

Hayatu'l-haywan, by Damiri; written A.H. 1372, in Arabic; zoological encyclopedia. 2 vols. Tehran, 1868. No pagination. (rare).

Ilmu'l-haywanat, by Uthman Beg, in Arabic; modern treatise on zoology. Cairo (?), 1886. Pp.775.

Tashrihu'l-faras, by Raja Rajeswar Rao of Haydarabad, in Hindustani; on breeds of horses. Lucknow, 1906.

Makhzan-i-ilaj-i-haywani, by Doki Nandan, in Hindustani; comp. about 1899. Indian veterinary art. Meeruth. 1900. Pp.137.

Zinatu'l-khayl, by Mahdi Hasan, about 1835; versified treatise on horses, in Hindustani. Cawnpore, 1907. Pp. 220.

Faras-nama-i-Rangia, by Rangin, Sa'adat Yar Khan of Delhi, died 1835. Versified tract on horses. Cawnpore, 1886. Pp.24.

Sayd-gah-i-Shawkati (or Baz-nama), by Yar Muhammad Khan Shawkat, comp. supposed about A.D. 1883, in Hindustani. On falconry and birds. Rampur, 1884. Pp. 338.

Tuhfatu's-sa'idin, by Abid b. Husayn Ansari, 1870, in Hindustani, on the lawfulness of the flesh of different animals for food. Lucknow (?). 1870. Pp. 16.

An anonymous but well written rubricated Persian manuscript (ca 1780 A.D.) - the Baz-nama - on the diseases on the falcon and their treatment. In this short treatise a description of the birds is briefly given. This rare manuscript was discovered by W. Ivanow in Hyderabad.

A reference to the annotated Catalogue under Faras-nama will furnish a fair account (manuscript, lithograms, prints) of the horse - favorite of Indian chieftains, especially of the Moslems - his varieties, his diseases with their medical and surgical treatment, and excellent colored drawings, in Persian, Arabic, Hindi, etc.

A rare anonymous Hindustani manuscript (Tibb-i-aspān) gives further information on the same subject. Another, Khayl-nama, transcribed in 1829, also gives a description of equine varieties. A versified book of the horse, 12 mo., red-and-black letter Persian manuscript, dated 1245, A.H., details and sings the praises the charms of that animal.

Still another manuscript poem in Persian (Husami) on the same subject is a fine piece of caligraphy and possesses some scientific value.

Two editions, 1873 and 1888, (Hindustani lithograms) on Animals and their diseases - 'Ilaju'l-baha'im - furnish an account of Indian animal pathology and the treatment of faunal disease, in general.

According to Dr. Resillac-Roese, Librarian of the Gest Chinese Research Library of McGill, there are comparatively few individual works on zoology in Chinese literature, as can be ascertained from the great Chinese Catalogue "Ssŭ k'u ch'uan she tsung mu, chuan (chapter) 115, 116, Tome IV, Vol. 32, original edition, A.D. 1790. Nearly all the material on Zoological subjects is found in encyclopedias, dictionaries of terms, some historical works and gazetteers of provinces. Important western works on Chinese zoology will be found in Henri Cordier's "Bibliotheca Sinica", Vol. I, p.171-188, Paris, 1881.

A few Sinhalese transliterated titles (in the form of Olas) and some Japanese captions on vertebrate Zoology will be found, with numerous Russian and other Slav headings. — periodicals in particular — in the appended Catalogue.

~~Periodicals~~

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CHAPTER XVIII.

and Serials

~~The~~ Periodicals on Vertebrate Zoology.

~~Ornithological Journals and Magazines relating to Publications during Ornithology, Mammalogy, Ichthyology, and Herpetology. Herpetology and Amphibiology.~~

~~Transactions, Serials and Reports of Natural History Societies.~~

Importance of Periodical Literature in Zoologic Study. — Catalogue of Zoological Society. — Zoological Record. — Annals and Magazine of Natural History. — Ornithological Periodicals, General and Local. — ~~Ornithology~~ London, Edinburgh and Dublin Magazine. — Publications of the various Royal Societies. — The Linnean Societies and their periodicals. — Proceedings of Local Naturalists Societies and Clubs. — The numerous Publications of French Sociétés des Sciences Naturelles. — Spanish Zoologic Periodicals. — Italian Periodicals on Zoology. — German Periodicals (many Naturforschende) issued by Gesellschaften, ~~Vereine~~ Naturvereine etc. — Swiss Periodicals on Vertebrate Zoology. — American Magazines, Serials and Reports

CHAPTER XVIII.

issued by Societies and Institutions. — The Transactions of British, American, French and German Associations for the Advancement of Science. — Proceedings of International Congresses and Conferences on Zoology and its Branches. — Journals and Serials published in Holland, Belgium, Scandinavia and Russia. — Local Periodicals and Serials of the Old and New World. — Canadian Periodicals. — Local Journals on Zoology published in the United States, Middle and South America. — African and East Indian Periodicals. — Australasian Magazines, Serials and Journals. — Japanese Periodicals. — Journals devoted to Vertebrate Anatomy, Development, Behaviour, University Societies and Departments, Embryology and other specialized Subjects. —

On several different pages of this Introduction the Compiler has, in a general way, spoken of the extreme importance of journals, magazines, serials, etc., in a study of faunal literature. These form, indeed, the very foundation of our knowledge of the subject. Much of the output constitutes a record of the work done in laboratories, museums and other institutions, partly or wholly devoted to zoology; hence it is specially a contribution to systematic zoology and also furnishes the latest and most scientific news in all departments of natural science. The number of these periodicals has enormously increased in late years and it is difficult for even the best equipped library to keep pace with them and to preserve full sets of their many volumes. The McGill libraries have, however, striven to make their collections as complete as possible and it is now proposed to furnish a list (comparatively a small one) of the most important zoological periodicals out of the hundreds of those now on the tables and shelves of the McGill libraries. It is, of course, impossible to mention all even the most useful of them in this Introduction, but the great majority of the really important titles will appear in the appended Catalogue.

The Compiler once more directs particular attention to the excellent ~~and much needed~~ list and geographical catalogue of periodicals on zoology published in the Catalogue of the Zoological Society, the fifth and last edition having been issued in 1902. If that indispensable volume were brought up to date (1930) it would form a ready and extremely helpful source of information that has now to be culled, often with much labor, from such ponderous tomes as the Union List of Serials, whose very completeness as a record of all scientific periodicals makes it for our purpose difficult to manage. Even the Catalogue of the British Museum (Natural History) has for the student of vertebrate zoology the shortcomings of its many virtues in that the inclusion of every natural history title is a thorn in the flesh of the student of vertebrates alone. ~~It is an attempt~~ In an effort to supply this want ~~it is the aim of the present~~ the Compiler has attempted in the present volume to furnish, in the excellent form of the London Zoological Society's Catalogue, a ~~complete~~ roster to date of most periodicals and serials devoted partially or entirely to vertebrate zoology. The work that adequately supplements this ~~catalogue is the~~ list is, of course, the Zoological Record.

A few current periodicals on vertebrate zoology especially avian contributions, are :- Ibis (British); Aquila (Hungary); Auk (U.S.A.); Beiträge zur Fortpfanzungsbiologie der Vögel (Germany); Berichte des Vereins Schlesischer Ornithologen (Germany); British Birds (London); Aviacultural Magazine (British); Condor (Pacific Coast, U.S.A.); Australian Zoologist; Emu (Australasia); Flora och Fauna (Scandinavia); Novitates Zoologicae (London and Tring); Gerfaut (Belgium); Irish Naturalists' Journal; Scottish Naturalist; Zoological Record (entire literature of zoology); Journal of the Bombay Natural History Society; Stray Feathers (India); Journal für Ornithologie (Germany); Kóesag (Hungarian) for Protection of Bird Life; London Naturalist; Norsk Ornithologisk Tidsskrift (Scandinavia); Bulletin Zoological Society of Egypt; Oiseau et Revue Française d'Ornithologie (France); Der Zoologische Garten; Zoologischer Anzeiger; Ornithologische Monatsberichte (Germany); Aaresberetning (and Aarshefter) of the Tromso Museum (Norway); Proceedings of the Academy of Natural Sciences of Philadelphia; Journal of Mammology, Baltimore; Proceedings of the Zoological Society (London); Revista do Museu Paulista (Brazil); Archivos and Revista do Museu Macional, Rio de Janeiro; South African Journal of Natural History; Anales of the Museo Nacional

El Hornero, issued by the Sociedad Ornitologica del Plata; de Historia Natural (Buenos Aires); South Australian Ornithologist; Uragus (Siberia); and the Wilson Bulletin (U.S.A.)

¶ More of a popular order are the Ornithologische Beobacter (Germany); Avicultural Magazine (Great Britain); Aviculture (U.S.A); Bird-Lore (U.S.A.); Bird-Notes and News (England); the publications of the numerous Audubon Societies (U.S.A.) and the East Africa and Uganda Natural History Society Bulletin.

International Congresses and Conferences on Zoology in general ~~and~~ ~~the various dates of meeting of the same~~ were interrupted by the World War but have since then resumed their meetings.

Several of these have been mentioned in connection with the directions to which they gave rise. Perhaps the chief meetings are those of the Congrès Internationale de Zoologie, ~~the~~ whose first Session was held in Paris in 1889. ~~and has~~ Since then the sittings have occurred about every four years — in Moscow, Cambridge (England), Leipzig, London, Berlin, Geneva, Boston (Mass.) Cambridge (Mass.), etc, the ninth ~~taking place~~ at Monaco in 1913. All sorts of Comptes-Rendus, Règles, Verhandlungen etc were issued after the various ~~Seances~~ Sessions, for which consult the appended Catalogue. ~~Most of the proceedings were published in Periodical literature. and~~ ¶ The ~~orgn~~ papers etc of the International Congress of Ornithology (first held in 1885) generally appears as its official organ, Ornis (q.v.). The last or Seventh (quadrennial) Session was held this year (1930) at Amsterdam. ¶ The International Convention for the Protection of Birds, held in Budapest, 1907, is reviewed by Otto Herman, ~~Otto (q.v.)~~

¶ ~~On several occasions~~ The Compiler has elsewhere spoken of ~~referred to~~ the great value to the advanced student of the Zoological Record, now in its sixty-fifth volume, at the moment ably edited by W.L. Sclater. (At least) the sections that include vertebrates ~~at least~~ should be accessible to everyone interested in that subject.

Another periodical essential to the studies of the specialist in vertebrate zoology is the famous Archiv für Naturgeschichte, 1835-date. Another is the Archives de Biologie, 1880-date. Still other is The Annals and Magazine of Natural History ~~(q.v.)~~ with its many mergers, changes of title and editorial management, since its first issue in Edinburgh in 1837. This journal is among the most important conservators of vertebrate faunal literature in any language.

The above four periodicals might well constitute a small but comprehensive reference library that contains most of the information required by a student of modern bibliography in vertebrate zoology.

¶ Many of the publications that have from time to time been issued by British Colonial natural history societies, etc., are listed in the appended Catalogue. As an example one may quote the Transactions and Proceedings of the New Zealand Institute, a composite association founded in 1867. This important periodical has been issued regularly since 1869.

It seems hardly necessary to refer to the fact that access to the voluminous periodical literature of general biology - which of course includes general zoology - is essntial to a serious study of ~~ornithology~~ vertebrates, and this truism ~~might be~~ is put forward as a reason for including them in this Catalogue. ~~many a (general) zoological or biological journal containing contributions to avian knowledge of greater import to the ornithologist than many of the titles in this list. However, the space at the Compiler's command has already been more than filled and he must refrain from wandering too far afield.~~ that study.

Of what might be termed "semi-avian" magazines, such as Eggs and Stamps, The Naturalist (devoted entirely to Ornithology and Geology), The Weekly Oologist and Philatelist, as well as others of a more ambitious type, the Compiler cannot ~~take~~ give more than ~~this~~ a passing notice, although some of them present papers of ornithological importance.

The numerous and important publications of the British Museum (Natural History) have been referred to many times in the present Introduction with a note that their titles are generally to be found in the appended Catalogue. The History of the Collections (1904–12), in 2 vols. and Appendix, should be in reach of every student of vertebrate zoology; nor should he despise the Books and Maps, Instructions for Collectors, Economic Series etc various Guides, intended in the first instance for visitors and amateurs. A complete list of these titles is published in the Cat. Br. Mus. (Nat. Hist.) Supplement, pp. 130–140.

The biologic publications of Cambridge University are more numerous than those of any other British University. The 46th Annual Report of the Museums (1912) gives an account of the natural history activities, that are still carried on. Of many local British journals are the Proceedings of the Cheltenham Natural Science Society (founded 1877), that began its New Series in 1907; the Journal of Economic Biology (now of Zoological Research) 1905 to date, edited by W. E. Collinge; and the Cotteswold Naturalists' Field Club, typical of dozens of such useful associations in the British Isles, published 14 vols. of Proceedings, 1847–1903. Still older is the Devon and Cornwall Natural History Society, founded in 1838, and its publications.

A specialized but important British periodical is Biometrika, a journal for the statistical study of advanced biology, 5 vols of which have appeared, 1901–07.

Among other British local periodicals devoted to natural history, the majority published by county and other societies, is the

Birmingham Natural History --- Society whose annual report has been regularly issued (with a few exceptions) since 1899. The Bradford Scientific (Association, founded 1875) Journal published its first number in 1904. The Welsh Museum of Natural History, Cardiff (founded 1863), later the National Museum of Wales, and the Cardiff Naturalists' Society both publish Reports and Transactions, the latter beginning about 1868.

The) ~~The more than usually~~ noteworthy Essex Field Club, previously mentioned, publishes a Year Book + Calendar (1905-14) and Special Memoirs, 1885-1910, including the Birds of Essex by M. Christy, pp. 8+302, 1 pl. and numerous text figs. ¶ Mention has been made of the Glasgow Naturalist. This journal has been issued regularly since the appearance of its first volume in 1909. ¶ The Hampstead Scientific Society (founded 1899) ~~publishes~~ has issued Annual Reports since 1891, as well as other works on the natural history of the neighborhood. ¶ The Hastings and East Sussex Naturalist (1906-date), the organ of the Hastings and St. Leonards Natural History Society (founded 1891) ~~and other publications~~ is among several useful publications of that local society: ¶ One must not pass over the Zoologic Publications of the Hull Museum, whose Publications, (Nos. 1-?85) (birds etc) are of distinct value.

¶ The

The periodical publications in the German language & local societies, museums and universities, other institutions are more numerous than those of any other country. The lack of space does not allow the Compiler even to list the chief of these, as the Catalogue does. The Zoologische Sammlungen issued by the (Berlin) Friedrich-Wilhelms-Universität is a good example, one of the first appearing in 1899. The Naturhistorischen Verein d. Preussischen Rheinlande etc and the Niederrheinische Gesellschaft f. Natur- und Heilkunde have both issued their Sitzungsberichte since 1906. The Badischer Zoologischer Verein (Karlsruhe) was founded 1899, since which date it has regularly published Mitthailungen, amply illustrated. The well-known Neue Zoologische Gesellschaft of Frankfurt a/M. has published the Zoologischer Beobacter, 1906-11. The Thurgauische Naturforschende Gesellschaft (founded in 1854), one of many similarly-named societies in German-speaking lands, has published regularly its Mitthailungen since 1857.

The very important Gesellschaft Deutscher Naturforscher u. Aerzte, several times mentioned in these pages as prolific of Zoologic literature, has recently (1868-1930) issued several important Fest- and Denkschriften, whose full titles will be found in the accompanying Catalogue.

he Oberhessische Gesellschaft f. Natur- und Heilkunde
as published its well-known Bericht since 1849.

Anhang

Verhandlungen der k. k. Reichs- und Hauptstadt
Buchhandlung zu Wien. Neue Folge. Band 1844.

There are many "separates" of ~~ornithological and general~~ zoological journals whose periodical status presents a difficulty. These are Berichte, Annuals, Year Books, Annual Bulletins, Jahresberichte, Aarsberetning, Annuaires, etc., generally printed as integral parts of a parent magazine and usually paged as it is. It often happens that these excerpts are provided with a special cover, title-page, index, and sometimes, with a preface entirely distinct from the ~~prefactory matter~~ of the periodicals from which they were extracted. In this guise the reprint is placed on the market and advertized as a distinct publication. When, in addition to these devices, the excerpt is separately paged, its claim to a place in such a compilation as this is much strengthened. The Compiler feels, therefore, that in the following Catalogue he may quite properly be criticized for accepting some of these abstracts and rejecting others of equal ~~or~~ greater value.

It may not be out of place to refer, briefly, to a few of these yearly reviews. One of them is Moske's Ornithologischer Jahresbericht über Pommern, printed in the Zeitschrift für Ornithologie. This ~~periodical~~ report appeared regularly for several years, and does not differ materially from similar contributions to journals that are quoted in booksellers' lists as bona fide periodicals.

In the case of annuals like the valuable Report on Scottish Ornithology, [q.v.] of which three issues were printed as Separate Publications and the remainder wholly as contributions to the pages, first of the Annals of Scottish Natural History and subsequently of the Scottish Naturalist, notes on the whole series are here appended.

Attention may also be drawn to the Reports of the Movements and Occurrence of Birds in Scotland by L.W.Hinxman and T.G.Laidlaw, that ran for many years in the Annals of Scottish Natural History. The E.S.W.Library of Ornithology has a series of these - 1891-99 inclusive - issued separately but bearing the pagination of the journal in which they originally appeared.

A short but excellent example of an annual, or multiannual, periodical is the Ornithologischer Bericht über Mecklenburg, of which the tenth report (1914-20) much delayed by the Great War, was printed in the Archiv. d. Fr. d. Naturges. in Meckl., 74., 1920.

Whatever their standing, annual reviews in the shape of bound "separates" form handy volumes for the research student ~~and professional ornithologist~~ even when complete sets of the parent journals are also accessible. For example, the E.S.W. Library has a "run" (from the Reichenow-Cabanis collection) of the Bericht über die Leistungen in der Naturgeschichte der Vögel, and Aves, edited by Hartlaub, von Pelzeln, Hellmayr et al, covering the sixty-one years between 1846 and 1907. These reference volumes are reprints from the corresponding Jahrgänge of the Archiv für Naturgeschichte, and in the shape indicated, save much time and labor otherwise expended in hunting references in the library copy of the general zoological periodical.

A minor but useful yearly review is the Koenig-Warthausen Ornithologischer Jahresbericht, one of the Jahreshefte des Vereins für väterliche Naturkunde in Wurttemburg, not separately paged, however.

~~+ Scandinavia + Continental Europe~~
~~Holland~~, Belgium + Scandinavia

Scandanavia, including Holland and Belgium, is ~~still~~ prolific
~~tinental Europe~~
of natural history societies, museums etc most of ~~them~~ which publish
periodical literature on vertebrate zoology. Here one may
mention, inter alia, the Bergens Museum whose Skrifter,
in annual volumes, first appeared in 1878. ~~and continued~~
The Annales de Zoologie de la Musée to Congo Belge, published
in Brussels since 1898, and the Mémoires de la Musée Royale
d'Histoire Naturelle de Belgique, 1900 to date, are among the
~~leading~~ important zoological periodical literature of Belgium.
Of some importance are the publications of the K. Norsk Frederiks Universitet,
issued in Christiania since 1895. ~~At Bergen there is a~~
~~Museum that is a~~
~~Reference has~~ already been made to the Dansk Naturhistorik
Forening, founded at Copenhagen in 1838, ~~and its important activities~~
as well as to the Dansk Ornithologisk Forening (founded
in 1906) whose Tidsskrift has appeared regularly since
1906. In ~~the same~~ Denmark, also, is published the
K. Dansk Videnskabernes Selskab, whose Biologiske
Meddelelser has regularly appeared since 1917.
A valuable contribution to vertebrate zoology ~~has been made~~ have
many years been made in the various periodicals and single monographs
issued by the Gothenburg Museum.

¶ Haarlem

De Hollandsche Maatschappij (and other works) continues to publish several natural history periodicals & the Archives since 1898; the Natuurkundige Verhandelingen (1900 - date) etc. ¶ The Naturhistorisches Museum and the Zoologische Gesellschaft are among the chief sources of periodical (and other vertebrate zoological) literature in Hamburg. Several of these have already been annotated in the appended Catalogue.

To the student familiar with the Scandinavian languages, there are several periodical reviews accessible. For instance, in a well-stocked Library is a set of early separates: Ansberattelser om Vetenskapernas framsteg, afgifne af Konigl. Vetenskaps-Academiens Embetsman, Stockholm, 1822-53. These admirable reports on bird life were contributed as follows : 1821-28, J.W. Dalman; 1829-31, S. Nilsson; 1832-36, B.F.Fries; 1837-50, C.J. Sundevall. ¶ Although this is not the place to attempt a complete account of such serials, it is even more difficult to place reviews that appear irregularly or that cover an uneven periof of years. Such a publication is R. Collet's helpful Mindre Meddelelser vedrór Norges Fuglefauna i Aarene ... , issued in several sections as appendices of the Norse Nyt. Mag. f. Naturv. The first part comprises the years 1873-76, the second 1877-80 and the third the years 1881-92. Such serials, issued in sections and separately paged may, perhaps, be regarded as periodicals, but it was decided to omit them from this Catalogue.

Finally, for the English reader the best annual reviews of the regularly published sort is the Zoological Record and the Ibis Index of Ornithological Literature, (1870 and onwards) by Sabin and Sclater, which for many years have furnished an admirable account of the literature.

In determining the status of a "purely ornithological" periodical, it was decided (with some regret) to omit those journals that deal exclusively (or mostly) with poultry, domestic pigeons, canaries, and the sporting aspects of bird life. For this reason it was decided that such otherwise interesting journals as The Homing Pigeon (17 vols., 1905-22), and Die Zeitschrift für Brieftaubenkunde, should be excluded. Poultry magazines and kindred by-products of scientific ornithology have an enormous periodical literature in many languages - particularly in English and German - scattered over the whole globe. The Compiler has gathered a list of nearly three hundred of these, and he has reason to believe that there are many more. Some of them are well illustrated and admirably conducted; and not infrequently they contain articles of decided merit, written by competent observers on subjects closely related to scientific ornithology. They occasionally discuss, for example, Mendelian problems, avian pathology and psychology, experimental aviculture, acclimatization, hybridism, etc.

Just what to do with such (generally annual) periodicals as Bird Calendars, Taschenbücher, Kalender für Vögel-Freunde, Bird Years, etc., is not easy to decide, but in view of the generous supply of magazines proper it was decided to pass them by with this brief mention.

Although it seems at first blush trivial to speak of it, yet who shall say that a century hence the "airy nothings" in our ornithologic periodicals may not acquire a certain value - sociologic, perhaps - and afford a means of determining just what sort of people we were? At any rate, the Compiler records the issues of one of these comic publications, The Auklet. The first number has as its minor title, Occasional Journal of Ornithological Minutiae, Illustrated, Vol., No. 1, 1920. Current. Anonymous. Privately printed. Washington, D.C. This amusing critique of men and things ornithological is well worth reading.

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Although most of the periodicals, including the annuals and the irregularly published bulletins, edited by the American Audubon Societies, have been listed in this Catalogue (and many of them are genuine contributions to the progress of scientific ornithology), ~~yet~~ yet the Compiler has been obliged to omit a few titles of this character because of his inability to obtain the data necessary for annotation. In this connection it is hoped that, after a proper interval, a supplement to or a second addition of this Catalogue will be written, perhaps by another hand, in which this and other defects may be remedied.

Of British periodicals devoted entirely or partially to natural history the name is practically legion, and the Compiler could not if he would mention in this place more than a small fraction of them. However, among the oldest of the general journals is the famous London, Edinburgh and Dublin Magazine, first published in 1728 and with several changes of major and minor titles, still continues its useful activities.

It may be well to repeat at this time that the appended Catalogue has a fairly good list (and the McGill libraries a corresponding supply) of these numerous British and Colonial periodicals and serials whose titles begin with the adjective Royal; many of them publish valuable articles on vertebrate zoology. Of course the publications of the famous Royal Society of London (founded in 1660) is the forerunner of them all.

A chain of Linnean societies was early forged in all countries favorable to such projects. Their publications are of outstanding interest to naturalists. Among them, and perhaps the most important, are the Transactions, Journal, etc., of the Linnean Society of London, founded in 1788; the Proceedings of the Linnean Society of New South Wales, 1877 to date; Transactions of the New York Linnean Society; the Bulletin and Actes of the Societé Linnéene de Bordeaux, founded in 1818, and the Annales de la Societé Linnéenne de Lyons, founded in 1822, the first volume of which was published in 1826-36.

French speaking countries have been ~~quite~~ provident of periodicals largely devoted to natural history. In addition to those already mentioned one might add such publications as the Bulletin scientifique de la France et de la Belgique that, with its varying titles, has been published regularly since 1869.

Of ~~the numerous~~ departmental and sectional periodicals the Bulletin of the Société des Sciences Naturelle de l'Ouest de la France (founded in 1891) has appeared since its foundation.

During the period of its publication, 1872-77, Gervais's Journal de Zoologie, Paris, was a valuable periodical and its six volumes still stand as a work of reference.

Of the many natural history publications by Museums in France those of the Musée d'Histoire Naturelle de Marseilles, founded in 1819, is a good example, especially the Travaux du Laboratoire de Zoologie Marine, and the Annales, the latter issued continuously since 1883. Of course the numerous and important periodical publications of the Paris Museum d'Histoire Naturelle quite overshadow all other French serials, including the Bulletin, Memoires of the Société Zoologique de France. The Annales of the former first appeared in 1802, the Bulletin of the latter in 1876.

During its period of publication (1849-79) the Revue et Magasin de Zoologie pure et appliquée was a notable French periodical and the same can still be said of the Revue Suisse de Zoologie, whose first volume was published at Geneva in 1893.

Another local French society, the Société des Amis des Sciences Naturelles, founded in 1865, has continuously issued a creditable Bulletin since 1866.

The Iberian Peninsula furnishes quite a few periodicals in part or wholly given over to natural history. One of these is the Memorias published by the Madrid Real Academia de Ciencias exactas (founded in 1847); another the Boletin of the R.Sociedad Española de Historia Natural (founded in 1871) first issued in 1901.

Several Italian natural history periodicals have already been mentioned; one of much importance is the Atti della Società Italiana di Scienze Naturali issued from Milan since 1859.

Taking them at random, of a few of the more prominent German periodicals in whose volumes will be found many valuable and original essays and articles on vertebrate zoology, one may mention the Biologische Centralblatt, founded by Prof. J. Rosenthal, Erlangen, 1881 to date. The Abhandlungen of the Dresden Naturwiss. Gesellschaft Isis have been published since 1860, the society itself having been founded in 1833.

An excellent example of the numerous array of local German journals is the Jahresbericht of the Naturwiss. Verein von Eberfelde, founded in 1846. More important are the several periodicals (Abhandlungen, Berichte, Katalogen, etc.) issued regularly by the Senckenbergische Naturforschende Gesellschaft, a vigorous society founded in 1817.

Of the German societies with mixed titles and objects perhaps the best known is the Gesellschaft deutscher Naturforscher u. Aerzte, founded in 1822 and issuing periodical literature with many important papers on vertebrate zoology since 1828.

In 1823 was founded the popular Gorlitzer Naturforsch. Gesellschaft, since which date the society has regularly published its Abhandlungen, etc. The Mittheilungen of the Greifswald Naturwiss. Verein (founded in 1866) has been regularly issued since 1869. The Halle Verein (founded in 1848) is still more productive of zoological literature, issued under various titles, especially since 1853; in the same town was published Der Naturforscher, 1774-1804.

Still another active society is the Mecklenburg. Verein der Freunde der Naturgeschichte whose Archiv have been regularly published since its foundation in 1847.

A most important journal devoted to zoology is that issued, among many others, by the Deutsche Zoologische Gesellschaft since 1897 - Das Thierreich.

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A rather important German periodical is Kosmos, devoted in particular to vertebrate embryology. A complete set (1877-86) of 19 volumes, is in the Blacker Library.

The important Verhandlungen, as well as the official Anzeiger, organ of the Deutsch. Zoologisch Gellschaft, has been issued since 1891 and 1890 respectively.

The organs of the numerous natural history societies - mostly in Central Germany - whose titles include the name Naturforschender Verein are catalogued, as a rule, under the names of the towns or provinces to which they belong. Some of them are quite importaht.

There are a few of the numerous general zoological German periodicals more valuable to the advanced student than the Zeitschrift f. Wissenschaftliche Zoologie, founded by C.T. von Siebold in 1849 and since regularly continued.

French and Swiss periodicals

¶ Of the numerous French (and Swiss) journals devoted to natural history, many of them issued by local museums and societies, a few have already been mentioned. Practically all the important serials and journals of this class find a place in the Catalogue.

¶ The Archives de Zoologie expérimentale et générale (of great value to the student) has been regularly issued in Paris since 1872, the 66th volume bearing date 1927. The Comptes-Rendus of the Ass. Française pour l'Avancement des Sciences (already mentioned) reached its (annual) 54th volume in 1930, so in the case of corresponding Associations elsewhere in the world of Science the Society has held meetings in almost every part of the great French Empire included in its sphere of action.

¶ By the way, (few) there are that know the forerunner of our now A. A. A. S. – the Association of American Geologists, founded in 1840. ¶ At Bordeaux was first published in 1895 the Procès-Verbaux of the Société des Sciences Physiques et Naturelles ¶ The Musée d'Histoire Naturelle at Geneva has published much periodical literature on Zoology, most of it, however, on invertebrates.

* Southern Europe +

Several Swiss serials and periodicals have already been mentioned. In addition one should remember the Mémoires of the Société de Physique et d'Histoire Naturelle of Geneva (founded in 1790) that have been issued ~~regularly since 1821.~~

The Bulletin of the Société Vandoise des Sciences Naturelle (founded in 1815) has ~~also~~ appeared promptly since 1842.

Southern Europe

¶ The South European countries supply a fair amount of periodical literature dealing with vertebrate zoology. The Budapest Magyar Nemzeti Múzeum published, inter alia, Die Vögel Ungarns (1899-1903) by G. Madarász, while the Magyar Tudományos Akadémia (from 1864 onwards) issued treatises of like character. The Academia Română (founded in 1866) has published various zoological papers from time to time. ¶ The long-established Musée d'Histoire Naturelle of Geneva has published a number of serials and periodicals, among them several Catalogues of its zoological collections.

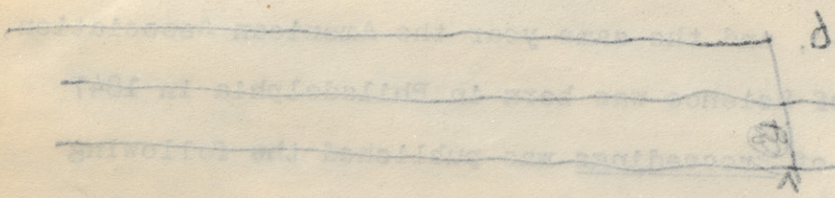
Local ~~American~~ (natural history societies), museums, (universities and other institutions), ~~etc~~, with their corresponding publications, are almost as numerous in America as they are in Europe. (At this time) ~~There~~ is space in this Introduction to list only a few (of these) in addition to those already mentioned ~~above~~ elsewhere. Among them (are) the (important) Journal and Proceedings of the Academy of Natural ~~Sciences~~ Sciences of Philadelphia. ~~1812~~ An Index to its Scientific Contents --- 1812 - 1912 was published in 1913. ¶ The New York State Museum dates from 1845 and has published Annual Reports since 1848, a Bulletin since 1887 and Memoirs since 1859. ¶ Notre Dame University (Indiana) has issued the bimonthly American Midland Naturalist since 1909. ¶ The (New York) American Museum of Natural History, one of the foremost of New World ~~the~~ institutions, continues to publish numerous important and serials and periodicals, details of which will be found in the appended Catalogue. ¶ The ~~P~~ Publications of the University of California on Zoology began in 1902, and have regularly been issued since that date. ¶ Vol. I of the important Biological Bulletin of the (Woods Hole, Mass.) Marine Biological ~~Station~~ Laboratory has been published continuously since 1899

The chief Hawaiian ~~source of information (founded 1899), to the~~ Natural History activity, the Bernice Pauahi Bishop Museum (founded 1889) etc at Honolulu, has issued excellent Occasional Papers (1899 - date) and Memoirs (1899 - date). ¶ Further mention must be made of the Illinois Natural History Survey (established in 1918) as one of the State University functions) whose Bulletin has been regularly issued since its creation. ¶ The Bulletin of Iowa State University Laboratories of Natural History and its continuations have been published in yearly volumes since 1888.

The University of Colorado Studies (vol. I, 1903) as well as the Bulletin, (Vol. I, 1900) with contributions on vertebrate Zoology, were published at Boulder, Colo. ¶ The Brooklyn (N.Y.) Institute of Arts and Sciences (founded 1824) is a large and influential combination of various departments of natural history. Prominent among its publications is its Cold Spring Harbor monographs (1903-date); Memoirs of Nat. Sciences (1904); the Children's Museum News, issued under different titles since 1902 and the Brooklyn Museum Quarterly (1914 - date); etc. ¶ Of the many Zoological periodicals issued by Harvard University those of the Museum of Comparative Anatomy (already mentioned) are to be kept in mind. ¶ The Departmental publications of the Canadian Government and its departments of Agriculture, Mines, Marine & Fisheries etc, as well as of the several Surveys furnish a goodly array of Zoologic literature, all of which will be found in the present Catalogue. ¶ As before intimated, the Carnegie Institute (Pittsburgh), founded 1895, has issued since 1898 valuable Publications of the Carnegie Museum, while the Carnegie Institution of Washington (founded 1902) began to publish (about 500) in 1903, a Year Book and numbered Publications (1902 to date), many with papers of great value to the student of Zoology. ¶ The Ohio Naturalist, published at Columbus, Official organ of the Ohio State University (founded 1870) has been issued at regular intervals since 1900. ¶

The American Academy of Arts and Sciences (founded in 1780) has continued its first volume of Memoirs since 1780, its Proceedings since 1846, ~~and the same year the American Association for the Advancement of Science was born in Philadelphia in 1847 and the first volume of Proceedings was published the following year.~~ The American Journal (Silliman's) has had an honorable career since the first issue in 1818.

~~The American Naturalist, another~~



Among the many publications of local American natural history societies is the serial Pacific Coast Avifauna (1900-date) dealing chiefly with bird life of that region and issued under the auspices of the very active Cooper Ornithological Club of California, (founded in 1893).

Partaking largely of what may better be described as a Serial is that admirable periodical described in the appended Catalogue under the ponderous caption United States Department of Agriculture; Biological Survey Division; North American Fauna, 1889 to date. These separately-paged memoirs are (when treating of vertebrate zoology) annotated under individual headings in the present Catalogue. The Biological Survey also issues a separately-paged Bulletin of great scientific interest and value, 1889-date.

Attention has already been drawn to the importance of the periodical literature issued by the U.S.National Museum - its Annual Report (1884 to date); Bulletin (1875 to date); Proceedings (1879 to date); and its Special Bulletin, 1892 to date.

In Europe scientific societies of this character as well as their numerous publications are much more prolific than in the New World, and it has not been possible to do more than mention a small fraction of them. A typical example is the Allgemeine Schweizerische Gesellschaft, etc., whose Verhandlungen were first issued in 1817. With several other publications it has been continued ever since.

Among the comparatively recent American foundations (1902) issuing various periodicals and serials - the Publications in particular - of great biologic importance is the Carnegie Institute, Washington, D.C., In the same breath may be mentioned the still earlier Carnegie Institute of Pittsburgh (1895) many of whose Publications are devoted to zoology.

Our limited space does not permit of more than a mention of a few of the numerous local North American periodicals devoted to zoology, but as an example of these the valuable Proceedings of the Portland (Maine) Society of Natural History (founded in 1843) has been continuously published since 1869.

Canada is well represented by natural history periodicals, listed in the Catalogue, of which the Canadian Naturalist, first published as the organ of the Natural History Society of Montreal (founded 1827, now defunct) in 1857. Another of similar name, Le Naturaliste Canadien, was edited by the Abbé L. Provancher, 1869-91, afterwards by the Abbé V.A.Huard.

The Ottawa Field-Naturalist's Club, founded in 1879, has published since that date its Transactions (1880-87), continued as the Ottawa Naturalist.

Toronto University (founded in 1827) issues a valuable series of natural science periodicals, among them a Biological Series, first edited by Ramsay Wright, 1898 to date.

South America.

Several South American natural history museums and societies (with their publications) have already been noted. Among these is the Museu Goeldi (Paraense) de Historia Natural, founded in 1867, whose Boletim was first published at Pará in 1894.

~~Of many South American periodicals on natural history~~ The Revista issued by the Museo de la Plata (founded in 1877) since 1890, and the Anales since 1891, should not be passed over.

To the roster of American publications in Zoology may be added the periodicals of the Boston Society of Natural History - Journal, Memoirs, Proceedings, etc., that first appeared in 1837. ~~and~~ It ~~has~~ since published many fundamental papers on vertebrate zoology. Sets of all these serials are on the shelves of the McGill libraries.

Another notable American society that has regularly issued its Journal since its foundation in 1870 is the Cincinnati Society of Natural History.

An important though popular magazine is Forest and Stream, New York, in which, since its first publication in 1874, have appeared many serious papers on vertebrate zoology.

~~Issued at first by the Montreal Natural History Society~~ is the flourishing and useful Canadian Naturalist, its compeer across the St. Lawrence being the widely known American Naturalist.

An important organ of an equally important institution is the Bulletin of the Museum of Comparative Zoology, Harvard University, Cambridge, Mass:, now in its 69th. volume.

A more recent source of vertebrate literature are the publications (various Series especially) of the Field Museum of Natural History, founded in 1893 at Chicago.

An American periodical, valuable for the research student, is Whitman's Journal of Morphology, first published in 1887. Of even greater value is Gegenbaur's Morphologisches Jahrbuch, issued regularly since 1876.

Another German periodical is the Zeitschrift für Morphologie und Anthropologie, 1891-1911.

In the Philippine Islands the Government Science Bureau is the one source of periodicals interesting to the zoologist. The Philippine Journal of Science, edited and first regularly issued by P.C.Freer in 1906, is now under the care of R.C.McGregor, a periodical of great scientific value.

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e Annals of the ~~Hddlllbbt~~ Durban Museum (founded in 1885) has been regularly issued since 1914; a General Guide to the Museum was published in 1916. ¶ The Journal of the East Africa and Uganda Natural History Society (founded 1909) has been published in London regularly since 1910.

Of African periodicals the Annals as well as the Reports of the Pretoria Museum and Zoological Gardens (founded in 1892), issued since 1908, deserve mention. Another African periodical of importance is the Revue Zoologique Africaine, Bruxelles, 1911 to date.

The American Naturalist, another magazine having vertebrate zoological interests, began its existence in 1868, and has appeared regularly since that date.

Of Dutch journals the periodicals of the Amsterdam Koninklijk Zoologisch Genootschap (1838) and of the Kon. Akademie van Wetenschappen (1851) are very important. They are noted in the appended Catalogue.

~~Australasia~~

Australia and New Zealand have contributed quite a few zoological periodicals to vertebrate zoology, some of which have already been mentioned. ¶ The Queensland Museum began publishing a serial — Memoirs — in 1912, which has been regularly issued since. ¶ The Canterbury Museum (Christchurch, N. Z.) has been issuing Guides since 1900 and Records since 1907, dealing with the flora and fauna of the Dominion.

¶ In 1896 was first issued the Geelong Naturalist and The Wombat, now consolidated under the first named periodical. It is the flourishing organ of the Geelong (Victoria, Australia) Naturalists' Field Club, founded in 1880.

A well conducted local magazine is the Annals of Scottish Natural History, first appearing in 1892.

In 1882 was founded the Australasian Association for the Advancement of Science whose (Annual) Reports have appeared regularly since that date.

Of Northern European countries Finland contributes several excellent periodicals the chief of which is, perhaps, the Acta Societatis pro Fauna et Flora Fennica, Helsingfors, regularly issued since 1875.

e Far East - ~~is the source~~ British India, Ceylon, Dutch East Indies, Indo-China, Malaysia, Japan etc is the ource of many ~~museums~~ activities furnishing periodicals f interest to the vertebrate zoologist. One of the most ~~fruitful~~ rolific of these is the (Calcutta) Indian Museum already entioned. Its Memoirs (~~publishing~~ separately paged papers) and Records, ich begun in 1907, are important serials, while Guides, ~~and~~ atalogues, and Lists ~~etc~~ continue to be published. ¶ Among the issues the Ceylon Government is the ~~Annual~~ Report of the Marine ~~Biologist~~ (1909-date) and the Coloured Plates of the Birds of ylon (1926-30) for which it may be mentioned, the Compiler furnished the made by Lt. Col. Harvey. inal drawings. The Colombo (Ceylon) Museum, founded in 1875, has issued not only the usual Guides, Reports and Memoirs ut sponsored the well-known Spolia Zeylanica, vol. I of hich was published in 1903. ¶ The Museums Department of e Federated Malay States has been publishing regularly ~~a Journal~~ illustrated Journal, from Kuala Lumpur, since 1905, and an Annual Report since 1911.



Of voluminous Russian periodical literature, among the most important are the publications of the Société Imperiale des Naturaliste, Moscow, founded in 1805 which, with several vicissitudes of name and dates of publication, has been issuing Mémoires, Bulletins, etc. since 1809.

Of periodicals of far students of Far Eastern Zoology, none is of greater value than the Journal of the Bombay Natural History Society, issued regularly since 1886, as mentioned, and the publications of the various Royal Asiatic Societies, mostly branches of the parent London Society.

Several Australasian periodicals devoted to natural history have already been mentioned, and many more are on the roster of the Catalogue. An important example is the Journal and Magazine of the Field Naturalists' Club of Victoria (founded in 1880) issued since 1884, while the Emu, organ of the Royal Australasian Ornithologists' Union, has been regularly published for many years.

Among ~~the~~ University institutions, devoted to natural history, and very numerous in the United States, one may mention, ~~as an example,~~ the Illinois State Laboratory of Natural History, founded in 1862, whose Bulletin has been issued since 1876.

Another typical example of local American societies issuing praiseworthy periodical literature is the Wisconsin Natural History Society, founded in 1857, ~~[illegible]~~ that published its Bericht, first in 1871; Bulletin and Proceedings since 1885 and Occasional Papers, 1889-96.

As already noticed, Italian scientific societies were among the earliest foundations, and among the first to issue their own periodicals and serials. One of these, the Reale Instituto di Studi Superiori, of Florence, was organized in the 14th. century, although its natural history Pubblicazioni were not begun, as separate memoirs, until 1877.

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CHAPTER XIX.

Printed Books, Manuscripts and Drawings

Unique and Rare in the Zoological Libraries of McGill University.

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Autograph letters.— The Woodward, Darwin, Bowdler Sharpe, Elliott Coues, Sherborn, Robt. Ridgway, Brewster, Casey Wood, R. Macgregor and other Collections.— Original Drawings and Manuscripts. — Rabié.— Wm Lewin.— Feather Book of Minaggio.— James Forbes.— F.W. Frohawk.— Ronald Green.— John Gould.— Hayes Family.— Keulemans.— Joseph Wolf.— Samuel Howitt.— H.W. Weir.— A. Machin. — F.W. Surtees.— E.A. Wilson.— J.J. Shore.— W.E. Powell.— Karl Plath.— . Neale.— R. Dias.— W.R. Fisher.— G.M. Henry.— John Duncan.— W.J. Belcher.— The Taylor White Collection of watercolors.— Van Huysum.— . Collins.— P. Paillou.— E. Albin.— G.D. Ehret.— G. Webster.— Lady Elizabeth Gwillim.— P.H. Gosse.— John Walcott.— J. Gunlach.— t. Grönvold.— Samuel Pepys' copy of Willughby's Ornithologia.—

Wilson.

XIX

Rare and Unique Zoological books. – G. Germano. – J. J. Audubon. – Elliott Coues. – Sir W. Jardine. – John Latham. – Wm. Turner. – J. Lemoine. – T. P. A. Leisler. – Jas. Backhouse. – L. P. Vieillot. – Unique Persian Codices and Printed Works on Zoology. – Original manuscripts. – G. A. Borelli. – Antoine Fée. – I. G. Saint-Hilaire. – Dame Juliana Berners. – Jerdon and Blyth. – Pliny the Second. – Bewick Chapbooks. – Alex. Wilson. – Rabanus Maurus. – 1508 edition of Oppian. – Merrem's Beytrage. – Flamen's copper plates. – Jan van de Straet's book on Venery. – Siebold's Fauna japonica. – John Gould's Birds in manuscript. – Jo. Ursino. – Martin Saint-~~Ange~~ Ange and his Traité élémentaire, 1834-40. – The very rare Storia naturale of Eugenio Bettoni. – Balthasar Monconys' Journal des Voyages, 1665-6. – Schonevelde's North European Ichthyology. – Barthomaeus Anglicus. – Paul Barthez. – Sir Joseph Banks' manuscript. – Leisler. – Milne Edward's Library rarities. – Rare works of Prince Bonaparte. – Martin Saint-Ange. – Monconys' Journal. – Father Bougeant. – Borkhausen's Teutsche Ornithologie. – A rare Buffon. 40

Every large library gathers in the course of time a number of literary treasures that vary in number and quality with the enthusiasm, collecting spirit and funds at the disposal of the librarian or his advisory bodies. In the case of McGill the zoological collectinns not only have acquired their share of these rarities but have also extended their acquisitions to rare and unique items not generally considered in University quarters as related to library activities. The descriptions that follow are not intended to glorify the McGill acquisitions but to furnish the student with the characters of the unusual titles accumulated by every large library of the present kind. In the latter category is a unica collection of letters of naturalists. These are regarded by the Librarian and the Compiler of some importance because of the character of the subjects generally discussed in them and because of the light thrown on the scientific life and character of the writers, their work, their opinions and their peculiarities. A genuine history of the progress of vertebrate zoology cannot be written unless one is acquainted more or less intimately with the working methods and daily doings of the makers of that history.

By purchase and gift the Blacker and E.S.W.Libraries have in the course of ten years or more collected over 25,000 letters and unpublished manuscripts written by nearly every prominent writer on zoological subjects from the seventeenth to the twentieth centuries. Chief among these are the Woodward (British Museum), Bowdler Sharpe, Elliot Coues, Sherborn, Robt. Ridgway, Brewster, McGregor and Casey Wood collections. This assemblage of autograph material, alphabetically arranged and stored in fireproof containers, are, of course, accessible only to responsible and advanced students of zoology.

Much of it cannot be published now but most of it has a direct and important bearing on the history of zoology. Moreover, the Compiler believes that the future historian of natural science and its builders will find a mine of information in these more or less personal records.

¶ Original drawings - mostly ~~[illegible]~~ illustrations for zoological works (already published) - by artists more or less famous in the annals of natural history are fairly well represented in the McGill libraries. Unfortunately the collection is weak in the works of American artists; it lacks original examples of Audubon, for instance; but the Compiler hopes to remedy that defect in the near future.

A few of the more important acquisitions in this line, taken at random, will now be mentioned.

At the instance of Dr. Alex. Wetmore, the Blacker Library acquired recently 4 folio volumes of unpublished acquarelles, with manuscript descriptions and index, by Rabié, of the Histoire Naturelle de St. Domingo. These important americana were painted from nature by a French artist in the West Indies between 1767 and 1784, and consist of colored drawings of 59 species of birds, 75 or fishes,

reptiles and crustaceae, as well as 127 sheets depicting several hundred other natural history objects, found in a important West Indian island. Dr. Wetmore has promised to make the avian portion of this collection the basis of a paper on the subject.

The Blacker Library has many original drawings by the well-known eighteenth-century artist-author, William Lewin. Among them is a portfolio of water colors (made in 1785) of British bird eggs painted from the Portland Museum collection, being 90 original drawings, depicting 146 eggs, on thick cartridge paper, with title, descriptions, and index in Lewin's handwriting, 4to. (probably unique). The figures correspond mainly with the plates in his British Birds, but seem to have been executed with greater care and were doubtless painted before 1786, as the contents of the Portland Museum were sold in April of that year.

Probably the most valuable of the ~~systematic~~ unique zoological items in the McGill General Library is the Feather Book of Dionisio Miriaggio, an Official of the Court of Milan. Its curious title is dated 1618, thus making the author-artist a contemporary of Shakespeare. The book itself with a ~~reproduction~~ reproduction of one of the curious feather-made pictures is described by the Compiler in Ibis, p. 731, 1927. It is a huge folio, 19 x 12½ inches, five inches thick, metal clasped and bossed, and containing 156 pictures of various objects - largely birds. The scientific importance of this collection lies chiefly in the fact that the birds depicted are as much as possible the bird-skins themselves with their original claws and mandibles! Among them we find well preserved specimens of Song-birds, wading birds, birds of prey etc. The date of their preparation morgates that they are, ~~makes them~~ in all probability, the oldest collection of bird skins known to ornithologists. Most of the examples have their vernacular names attached. This extremely important, well-preserved and unique collection in all ~~world~~ ~~should~~ ~~must~~ undoubtedly be further examined and reported upon by a systematic ornithologist.

Preface to the Annotated

Catalogue

partly written +

An interesting portfolio with some historical value is a collection of 54 sheets — 30 figures of Indian birds; 16 of eggs; 12 of oriental serpents and other vertebrates — for illustrating James Forbes (1749-1819) Oriental Memoirs, 1813. The drawings were made in India by the author-artist about 1760 - 1813.

Of the younger school of animal painters Ronald Green, ~~(b. 1892)~~ born in 1892, at Rainham, Kent, has made a name for himself. He has illustrated Pycraft's Flight of Birds and ~~drawn~~ made many other drawings for well-known publications. The Blacker and E.S.W. Libraries have representative collections of his paintings.

It is not generally known that John Gould (assisted by Mrs Gould) drew some of the bird portraits for his celebrated Birds of Australia, yet the Blacker Library possesses among its most valued ~~original~~ drawings 22 water colors, most of which were used for the purpose just indicated. The notes on the margins of the drawings (made between 1831-36) are in the handwriting of Mrs Gould.

Both the Hayes and the Hays families of animal portrait painters are represented in the Blacker and E.S.W. Libraries. Of the former, Charles Hayes is least known. was, the however, the son of the famous William Hayes. ~~(q.v.)~~ vide infra. His works are represented in the E.S.W. Library by a portfolio of 50 ~~plates~~ well executed sheets of original drawings of birds, without descriptive matter.

William Hayes (1729-99) is best known as the artist who supplied the admirable illustrations of the Portraits of Birds --- at Osterley Park. He drew these and many other paintings both alone and in collaboration with other members of his family. A portfolio of ~~the~~ 49 colored paintings, ~~drawings, &c~~ from the library of Lord Willoughby de Broke, now in the Blacker collection, ~~were~~ made in conjunction with A. Hayes, ~~and~~ were drawn between 1779 and 1789.

Original sketches and water-color drawings of the celebrated animal painter John G. Keulemans (1842-1912), born in Rotterdam but domiciled in England, are well represented in the McGill-mostly Blacker-collections. Many of the original aquarelles, sketches and colored lithograms intended to illustrate Sir Walter Buller's Birds of New Zealand, all (not colored lithograms) of the original water-color drawings for St. John Mivart's Canidae and a portfolio of selected drawings made to illustrate papers in Ibis, Proceedings of the Zoological Society and many other periodicals and treatises are among the treasures of the McGill collections. A unique item in this artist is a series of oil portraits on glass of British birds for his friend Bowdler Sharpe, also in the Blacker Library. Altogether Keulemans was acknowledged to be the best portrait painter of birds for illustration during the last three decades of the nineteenth century.

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One of the best known of ~~the~~ British ~~best known of the British~~ A Zoological illustrator-artists is F.W. Frohawk. The Blacker Library has several of his painstaking and beautiful drawings.

Naturhistorisches Staatsmuseum. (K-K. Naturhistorisches Hofmuseums). (Wien).

1886-date. Annalen.

1917-date. Denkschriften.

1924-date. Veröffentlichungen.

1924-date. Verein der Freunde des Naturhistorischen Museums. Vienna.

Among the pictured treasures of the Blacker Library are 95 original charcoal drawings, 79 of which were used to ~~illustrate~~ reproduce the lithographs of D.G. Elliot's beautiful Phasianidae.

The remaining sixteen were made for the same purpose but were never published. (These unique originals were made by) Josef (or Joseph) Wolf (1820-99), ~~a~~ famous animal illustrator of German birth who came to London at the age of 28 and for the remainder of his long life was employed as an illustrator by Robert Gray, John Gould and numerous other authors who accorded him first rank as a producer of animal portraits.

A representative but small assemblage of original drawings on 26 plates - some of the figures unfinished - are from the brush of Samuel Howitt (1765-1822). Probably by a member of the same family but of later date (ca. 1840) is an excellent collection of 400 drawings in color of British birds' eggs, with descriptive MS. text and ~~systematic~~ both vernacular and systematic names - evidently prepared for publication.

~~to~~

HERE ACCOUNT (BEING TYPED) OF DODO FRONTISPIECE.

Another artist-illustrator of ~~Dodo~~ books and papers on animal life is H. W. Weir (1824-1906). In the Blacker Library is a most interesting collection of ~~signed~~ 90 spirited, original, pen and pencil drawings depicting various ~~faunal~~ faunal species, mostly birds, (signed) and dated 1869-1901.

A collection of considerable historical and scientific value are the 453 well executed original drawings of the American A. Machiēn (1861). drawn on 173 plates, with a manuscript title-page, "Abbildungen zur Naturgeschichte der Vögel, etc, / New York, 1861". The collection is from the library of the late George N. Lawrence.

In the library copy of E. L. Layard's Birds of South Africa, 1867, are inserted ten original drawings of African birds by the artist, F. W. Surtees.

In the Blacker Library are (13) valuable drawings by H. Grönvold and E. A. Wilson made (1899-1901) to illustrate the Report of the Voyage of the "Southern Cross" to the antarctic regions, published in 1902.

One of the most valuable ~~natural~~ manuscripts in the Blacker Library is an unpublished Appendix (in three volumes) to Latham's Birds (1821-28), with 195 original watercolors of Indian avifauna (by F. J. Shore.). Most of these are not to be found in the 1821-28 edition, or if they do appear, the coloring is probably ~~incorrect~~. This fact is pointed out by the artist-editor who states that almost every picture in his collection is painted ad naturam so that unaltered plumage is depicted. Various notes accompany each drawing. A more complete review of this historical series of drawings will be found in the appended Catalogue.

other
small but unique collection of water-color drawings by W. E. Powell
re in the Blacker Library, good examples of an
illustrator for popular periodicals.

The E. S. W. Library has a representative collection of a rising
young artist, Karl Plath, born in Chicago, 1886, who has made
many successful water and oil paintings of birds for well
known magazines and books.

A really famous ~~picture~~ oil painting by a well-known animal
painter, E. Neale, who illustrated entirely Booth's Rough Notes of
British Birds and contributed some of the illustrations of Dresser's Birds of Europe,
was presented by Mrs. W. J. H. Craddock to the E. S. W. Library. It
pictures the Golden Eagle, ~~and~~ the canvas measuring 3 ft x 2 ft. 4 in.

7 Unusually good examples of original drawings of East Indian birds by a native artist, R. Dias, are in the Blacker Library. This collection, bound as an oblong folio, and gathered between 1878 and 1881, consists of 110 colored drawings of birds, 11 of nests (two of which are in black and white) and one of eggs. Many sheets bear a printed reference to corresponding species in Jerdon's Birds of India. They range in size from 5¼ X 2½ to 16¾ X 14½ inches.

¶ A unique item in the Blacker Library is a collection bound in three interleaved volumes containing 257 sheets of water-color drawings (328 subjects) of British birds eggs by the noted artist, William R. Fisher. These drawings made in 1845, with manuscript descriptions and other notes, were intended to supplement the second edition of Yarrell's History of British Birds. In the MS. preface, dated 1847, Fisher says "the figures of the rarer eggs are chiefly from Mr. Yarrell's cabinet." This fine ōological atlas and letterpress was never published.

¶ A remarkable collection of original water-color paintings of animals was secured for the Blacker Library in 1928. These animal portraits were painted between 1720 and 1740 but all efforts to identify the artist have failed. After two centuries it is not easy to obtain information regarding an illustrator who does not sign his works. The bound quarto volume of several hundred well executed figures has only this dated title page:— "Collection d'oiseaux et d'animaux peints d'après Nature".

¶ A ~~unique~~ small but unique collection ~~of~~ of well executed drawings ~~by a modern artist~~ are fourteen water-color paintings of European birds of prey by John Duncan, an English illustrator who in 1898 published his own Birds of the British Isles. ¶ An unusually fine series of ~~water colors~~ aquarelles ~~of birds~~ are from the brush of an unknown French artist, ~~who~~ who flourished at the end of the 18th century. These carefully executed drawings represent 95 birds, 7 butterflies and 1 bat.

P. Of recent original drawings by animal illustrators of the first class the Z. S. W. possesses quite a few. The most important is the practically complete portfolio of colored drawings of the Birds of Fiji (about 150) by W. J. Belcher, of Suva. The depiction of the bird life of this Polynesian group, with its appropriate surroundings, occupied nearly fourteen years of the artist's leisure, each bird being painted ad naturam, nearly all from live specimens in their native habitat. A number of the pictures have been used to illustrate published treatises on the avifauna of ~~the~~ Fiji, ~~particularly~~ especially a monograph on the Birds of Fiji by the present Compiler and Dr. Alex. Wetmore.

The single colored illustration that serves as a frontispiece to the present work has a history that the Compiler has already told in The Ibis, of October, 1927, with the title "Two hitherto Unpublished Pictures of the Mauritius Dodo." It will on account of its unique character perhaps bear repetition here:-

"On 16 June, 1926, there was sold at Sotheby's what is in all probabily the most notable collection of water-colour drawings that has engaged the attention of natural history devotees for many a year. This property was described in the auction catalogue as 'A magnificent Collection of Original Water-Colour Drawings of Natural History Subjects, by J. Van Huysum, C. Collins, P. Paillou, Eleazar Albin, G. D. Ehret, and G. Webster, loosely inserted in 29 vol. old half calf. The Collection comprises (among 495 drawings of flowers and insects) Birds: 659 drawings, by C. Collins and P. Paillou, of English and Foreign Song Birds, Game Birds, etc. in 16 vol. Beasts: 265 drawings, by C. Collins, of Animals from Hudson Bay, North America, Carolina, Brazil, Peru, India, etc. Fishes, etc. 22 Drawings of Fishes, Crocodiles and Tortoises, C. Collins and E. Albin.'

"This extensive array of aquarelles was originally made for Taylor White, F.R.S., of Wallingwells, Nottinghamshire, for a time Judge on the North Wales Circuit, and a man of considerable means. He was certainly an enthusiastic naturalist, a collector of curios and a liberal patron of the arts. That he had a large collection of stuffed birds and other animals

is abundantly shown by the notes he made on many of the drawings. For example, on the painting of what is entitled "Phaëops Minor" is written:-"This bird, with many others, was brought me from North America by my learned friend, Hodgkinson Banks, Esq." And, again:- "This bird (Falco lagopus) and the next, which I take to differ in sex only, were given me by Mr. Banks, together with many others that he brought from Canada and Labrador." The following notes are appended to the picture of the Cow Deer:—"This beast with the Female was brought from Bengall and presented to Ld. Clive by Govr. Cranwell in the year 1767. The whole form of its body Divers too much from the Goats particularly its head and tail that can not properly come in to that Class. So that I considered it as a new Genus undescribed by any Author which I have met with."

Any doubt as to the size and importance of the Taylor White collection disappears on the discovery by my friend, Mr. W. J. H. Craddock, of a reference to it in the Bowdler Sharpe edition of White's Natural History of Selborne. On 12 April, 1770, Gilbert White, in a letter to Daines Barrington, writes:- "the collection of Taylor White, Esq. is often mentioned as curious in birds, etc.; can't I be introduced when in town, and see this museum of my namesake?"

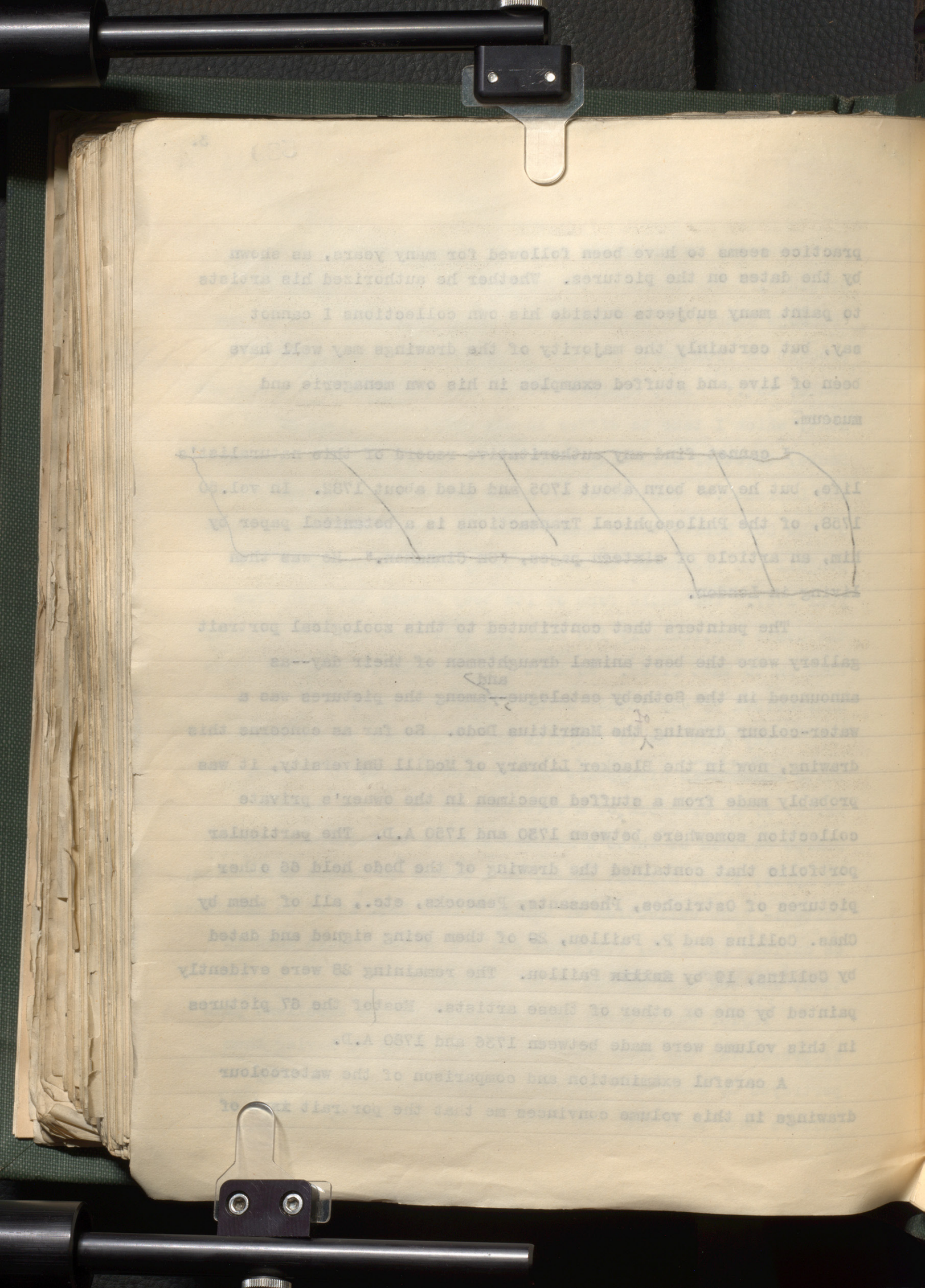
Taylor White early put into practice the excellent plan of preserving the appearance of his specimens by having them portrayed by competent artists, not only in their natural colours but, when that was feasible, of life size. This

practice seems to have been followed for many years, as shown by the dates on the pictures. Whether he authorized his artists to paint many subjects outside his own collections I cannot say, but certainly the majority of the drawings may well have been of live and stuffed examples in his own menagerie and museum.

~~I cannot find any authoritative record of this naturalist's life, but he was born about 1705 and died about 1782. In vol. 50 1758, of the Philosophical Transactions is a botanical paper by him, an article of sixteen pages, "On Cinnamon." He was then living in London.~~

The painters that contributed to this zoological portrait gallery were the best animal draughtsmen of their day--as announced in the Sotheby catalogue, and among the pictures was a water-colour drawing of the Mauritius Dodo. So far as concerns this drawing, now in the Blacker Library of McGill University, it was probably made from a stuffed specimen in the owner's private collection somewhere between 1730 and 1750 A.D. The particular portfolio that contained the drawing of the Dodo held 66 other pictures of Ostriches, Pheasants, Peacocks, etc., all of them by Chas. Collins and P. Paillou, 20 of them being signed and dated by Collins, 19 by ~~Exixix~~ Paillou. The remaining 28 were evidently painted by one or other of these artists. Most of the 67 pictures in this volume were made between 1736 and 1780 A.D.

A careful examination and comparison of the watercolour drawings in this volume convinces me that the portrait ~~ixxx~~ of



the Dodo is by the brush of Charles Collins, who painted it about 1736 A.D., in the same year in which he published his "Set of Twelve Hand-coloured Birds, with 112 Figuresof Animals," T. Bowles, London. These, by the way, were the first coloured figures of birds issued in this form in Great Britain.

"I understand that the previous owners of this remarkable collection rarely opened the portfolios in which the drawings were stored, and that this fact explains the freshness of the pictorial colours and the whiteness of the paper on which they were drawn nearly two hundred years ago. They have all the appearance of having been painted quite recently. In consequence I am not aware of any other painting now in existence that affords as clear and definite a portrait of the Dodo (Raphus cucullatus).

"So far as the picture of the Black Dodo is concerned, the artist undoubtedly ~~painted~~ painted it with either a living or stuffed specimen in ~~from~~ front of him. As a matter of fact, we do not know how many examples of the two Dodos were imported into Europe in the early years of the 17th century, and there was then quite as good a chance of the bird appearing in Venice, Genoa or Milan as in Amsterdam or London."

A One of the most important collections of original paintings in the McGill libraries is that by a comparatively unknown artist, Lady Elizabeth Gwillim (1763-1897). The compiler has already told the story of this interesting "find" in The Ibis, July, 1925 and the following extracts repeat the tale of a search in the cellar of a London dealer and the discovery there of a parcel containing about thirty small (10 x 14 in.) mounted and coloured drawings of Indian Fishes. Each mat bore an auctioneer's (or dealer's) printed number; a few were signed 'E.G.' and upon still more were written legends (that Sir Henry Drake-Brockman later translated for me as Urdu) of the native names of the subjects portrayed. "With the contents of this package I was shown a portfolio containing paintings in colour of a few Indian flowers, inscribed with both their ~~English~~ trivial and systematic names. Pasted on one of the front pages of this portfolio was a leaf on which was written "Elizabeth Gwillim, Madras, 1800-1806." While I was examining these drawings and asking for more, a salesman happened along and said to the proprietor, 'I think that before I went to France in 1914 I saw a collection of bird paintings down stairs.' Shortly afterwards this clerk appeared bearing an immense, dust-laden, but extremely well made portfolio about five feet broad and four high. I noticed that it was brass-bound, provided with a safety lock and a wide wooden back. It must have weighed thirty or forty pounds. On it were

painted barely decipherable initials and a date-"E.C.K. 1800" The contents amazed and delighted me. I do not claim to be an art expert, but I realized at once that the paintings of Indian birds in the pockets of the giant container were by the hand of no mean draughtsman.

We are all well acquainted with the productions of brush and pencil wielded by "ladies of quality" during the Georgian and early Victorian periods, and I fully expected to find these amateurish efforts displayed in the bird drawings, despite the rather favourable impression made on me by the paintings of the fishes and flowers. But I was agreeably mistaken; not only were the birds--so far as I then knew them--faithfully depicted as to plumage and posture, but the backgrounds were painted in a fashion worthy of Keulemans or Grönvold. They were in water-colour, carefully finished and on fine paper. Some of them were mounted, and all were numbered in the handwriting of the artist. Many bore (on the backs mostly) descriptive notes--measurements, colour-indications, and other data. Generally the systematic title, sometimes only the English or vernacular name, was appended. On some pictures there was no legend; on others only the genus was given. In addition to the completed drawings there was a small collection of unfinished sketches evidently the usual 'studies' of the artist.

Some of the paintings bore faint, but elaborate, pencilled descriptions of the bird-subject, references to its habitat, life-history, nesting-habits, oology, food,

sexual differences, etc., showing that the artist was, for her day and generation, a well-informed zoologist.

In every instance an appropriate background--Indian landscape, trees, shrubs, on which the particular bird was accustomed to roost, flowers, fruit or animal food on which it fed--was provided.

In addition to notations by the hand of the artist herself the reverse of each portrait showed, as in the case of the drawings of the Indian fishes, a trade number, as if the collection had been prepared for public sale or auction.

After I had acquired this rather remarkable "find", I naturally tried to trace the paintings to their original source, but in vain. All the dealers could tell me was that they were purchased by them "at a sale in the country" many years before, but exactly when and where they could not remember, and were unable to discover, as no record of the sale had been preserved. From time to time the portfolio had been resurrected and an occasional picture sold; ~~mostly for framing but sometimes for decorating fire- and other screens~~ it was impossible to say who bought these odd lots.

I carefully cleaned the Gwillim pictures of their century of dust and other accumulations, and was much pleased to find that, chiefly owing to the fine quality of the drawing paper, there was very little "foxing" visible, and that the well-constructed portfolio had further preserved them. The colours ~~(including the iridescence of certain plumage)~~ were remarkably well preserved; many a

brillaint hackle, mantle, wring and tail seem as freshly depicted as when they were painted more than a hundred years ago.

In all there were 121 drawings, and as the highest of Lady Gwillim's numbers was 201 (corresponding to 180 of the supposed dealer) it may be assumed that she had at one time and another painted at least the former number of bird-portraits. ~~which before they fell into the hands of the former dealer had probably been reduced by sale or otherwise to 180.~~ and, perhaps, distinct species.

The 121 pictures give one a fair idea of the avifauna--indigenous and migrant--of Southern India. Comparing them with Jerdon's list and with the fuller catalogues of Blandford and Oates, there are, of course, many gaps, many genera not represented at all; but, considering the circumstances, one can easily believe that if the artist had lived a few years longer she would have made a gallery of Indian bird-pictures of the greatest scientific value, worthy to rank with the major collections of the world. ~~Her sudden and early death, however, prevented the completion of the task, and probably consigned many of her best efforts to oblivion.~~

The importance of the collection may warrant a few further remarks about the individual pictures, as well as about the artist herself.

In the first place, almost all the drawings are life-size. If one reflects for a moment that Indian birds include many of the largest of the Old World avifauna, the reason for the immense portfolio I have described is manifest. For example,

the painting of Ardea cinerea measures, exclusive of the mount, 33¾ in. x 24 in.; of Dissura episcopus, 25½ in. x 24 in.; Herodias alba, 26¼ in. x 20 in.; Ardea manillensis, 26¼ in. x 19⅞ in.; Botaurus stellaris, 30 in. x 24½ in; Pseudotantalus leucocephalus, 25 in. x 21¼ in.; Gallus sonnerati, 33½ in.

The Accipitres are well represented and are proportionately figured; even the largest Vultures are painted life-size.

It has been the proud belief of Americans, myself included, that it was our Audubon who first produced full-length portraits of the largest birds, and certainly the pictures of the male and female Wild Turkey, of Washington's Eagle etc., and their exact reproduction in the elephant folio bear out that claim. However, so far as originals are concerned, we must now concede the palm to Lady Gwillim, who so far as I know, is the fist artist-ornithologist to paint full-sized and exact pictures of any considerable number of birds whose length exceeds, say, 35 inches.

I asked a number of trained ornithologist to examine and give me their opinion of the scientific and artistic value of the collections, among them Mr. Stuart Baker and Mr. Kirke Swann. The latter carefully revised the systematic names of the Birds of Prey, and expressed his complete satisfaction with the manner in which they had been depicted by the artist. Mr. W. L. Sclater also kindly looked over the portfolio and agreed that its contents would be of distinct value to students and would form a desirable addition to any research library. He pointed out

that in the evident faithful delineation of Living subjects the pictures formed a striking contrast to those common but really valueless drawings supplied by native artists of Indian birds. Moreover, they were likely to be free of those errors (discoloured and faded wattles, legs, ceres, mandibles, etc.) sometimes made by even our best artists who were obliged to make their drawings from bird-skins, in which decided colour-changes occur after death. Lady Gwillim, having been in a position to command live birds or recently killed specimens, had been able to avoid such mistakes.

Having settled the status of her pictures, it remained to find out something about the artist. I have consulted all the ordinary and most of the extraordinary sources of information that would occur to one interested in the matter, but with meagre results. Many authorities—among them Sir Henry Drake-Brockman (I.C.S), Sir William Foster of the India Office, Canon Bannister, the well-known genealogist of Hereford, whence Lady Gwillim's husband came to Madras, the Librarian of the Inner Temple, Mrs Frank Penny, the Madras historian and well-known Indian novelist and several others, who seemed likely to furnish some account of her life and career as the wife of a distinguished Indian judge—very kindly assisted me in this quest. In addition, I have carefully searched all the biographies, both British and Indian, at my command and have diligently explored, while in that city, all the Madras public libraries, including the files of the Madras Government Gazette and records in the Connemara Library at Madras. Through the courtesy of the Garrison Chaplain, The Rev. C. E. De la Bere, I was permitted

to examined the Parish registers of St. Mary's Church and to copy the inscription on Lady Gwillim's tomb. I regret to say that the information thus acquired is small in amount and of disappointing character. The Government Gazette, the only newspaper published in the Presidency at the time, gives only the usual formal notice of the lady's death, omitting her maiden name and birth-place. As Sir W. Foster remarks, obituaries of women of title were not fashionable at the beginning of the nineteenth century.

Briefly, all vital data I have been able to secure up to the present time is as follows:--Elizabeth Gwillim (maiden name unknown) was born (about) April 21, 1763, and came to Madras in the year 1800 with her husband, Sir Henry Gwillim (just made K.C.M.G.) of Hereford, one of His Majesty's Puisne Justices of the newly-formed Supreme Court of Judicature. She died (Dec. 21, 1807(at the early age of 44) and was buried in St. Mary's Church, Fort St. George, Madras. Cut in the pavement of this historic church, near the front entrance, is this inscription:-

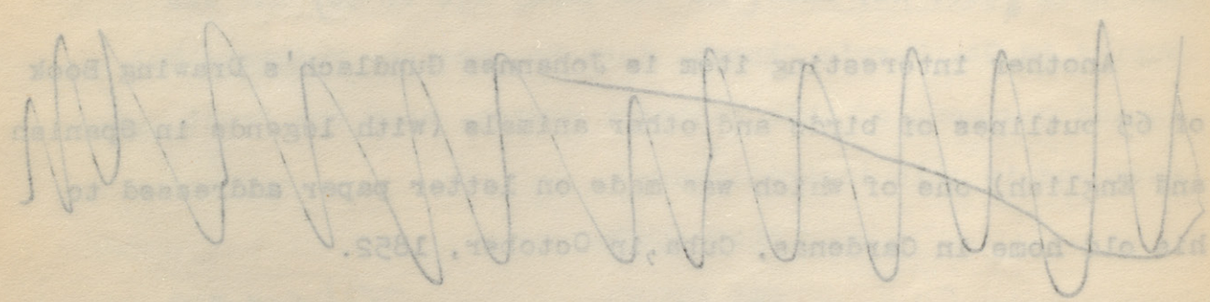
ELIZABETHA
PIA CONIUX
HENRICI GWILLIM EQ. AUR.
VIXIT ANN. XLIV. MENSES VIII
H. S. E.
MDCCCVII.

8pt caps

¶ Among colored drawings employed to illustrate published works one of the best examples are the well executed originals in the Blacker Library of Philip Henry Gosse's Illustrations of the Birds of Jamaica, used to make the 52 colored plates, 4to. London, 1849.

¶ Because of its interesting provenance the library copy of John Walcott's "Figures" (1788-89) is worthy of a brief note. It has two original drawings by the author of the 'Kite-fish' and the 'Six-lined Lizard' inserted with the author's bookplate ~~and~~ ; also an inscription of a former owner, on the title-page, 'Presented to me by his son, W. Walcott, 1817'.

Another interesting item is Johannes Gundlach's Drawing Book of 65 outlines of birds and other animals (with legends in Spanish and English) one of which was made on letter paper addressed to his old home in Cardenas, Cuba, in October, 1852.



In this connection,
A title of interest to the student of New World ornithologic literature is the following, in the E.S.W.Library :- J. Gundlach, (1810-1896). Original drawing book, 1852, 8vo. pp. 121 + 2. Cardenas, Cuba. This unique volume has about 67 spirited outline drawings of birds, with a loose leaf sketch of another taken from a letter addressed to Gundlach and postmarked "Habana, 18 Oct. 1852". It is addressed to him at Cardenas, Cuba, where he lived for many years. The birds are in each instance given their English, Spanish and zoological names. This item was secured for the E.S.W.Library through the courtesy of Dr. Chas. W. Richmond.

interest in scientific pursuits + it may be added the

(many examples of these in the McGill collection)

Among modern natural history artist-illustrators none is better known than Hendrik Grönwold, with a studio in the British Museum. He it was who painted the life-size portrait of the Amazon parrot, John IIIrd, now decorating the walls of the E.S.W.Library. All the drawings (plain and colored) illustrating Kirke Swann's monograph on the Accipitres (completed after the death of the original author by Alex. Wetmore) are in the Blacker Library, with many more in the best style of the artist. ~~One of the larger colored drawings,~~

~~of the beautiful hawk.~~

interest in scientific pursuits. It may be added the ~~fact~~

Every large library inevitably collects in the course of time printed books that are so rare that they are not on the shelves of ~~many~~ other collections of even greater size and importance. Of natural history libraries that of the British Museum stands preeminent, and its catalogue is the standard reference work for librarians and bibliographers in that special field. To possess a literary item of zoological interest "not in the British Museum", meaning thereby not listed in its Natural History catalogue so far printed, raises its value, commercial and bibliographic, considerably and indicates a probable rarissima. The McGill libraries have their share of these very rare items, a few of which may be ~~here~~ mentioned at this time.

interest in scientific pursuits. It may be added the ~~fact~~

Among the many interests in life possessed by the famous diarist, Samuel Pepys, was his library. In his diary he several times mentioned his collection of books, mostly bound in uniform calf, the covers stamped with the Pepys arms and further decorated with his bookplate. He was fond of arranging and indexing his roomful of literary treasures and of reading favorite volumes. He left this collection with its bookcases, manuscripts, diaries and other appurtenances to Magdalen College, Cambridge, and there, in a building set apart for the purpose, it is displayed for all the world to see.

Now it happened that John Ray, president of the Royal Society, of which Pepys was also a member, wishing to give the diarist a worthy book for his library, presented him with a copy of the well-known Ray-Willughby treatise on Birds. It was the English folio edition, beautifully bound in leather. Ray had it rubricated throughout and, in addition, the usual black and white plates of the original were carefully colored. An inscription told the occasion of the presentation. The recipient had his coat-of-arms stamped on the covers and, of course, added his book plate. It was a fine accession to the Pepys collection.

interest in scientific pursuits. It may be added the

On the death of the diarist his executors very properly decided to present a few library duplicates to relatives. They found two examples of Willughby's Birds — one the usual plain copy and the other the Ray presentation. By some unexplained error the latter was handed over to a Mr. Jackson - Pepys' relative - and the other retained in the Library. After the lapse of a couple of centuries this historic volume came on the market and was purchased for the Blacker Library and is now one of its chief treasures.

¶ There is some doubt as to the first printed book on (scientific) comparative anatomy but probably it is Giovanni Germano's folio, Trat~~umento~~atto degli piu principali animali — con il corpo humano, with copper plate illustrations, published at Naples, 1625. The Blacker Library has a copy, so far as the Compiler knows, the only one in the New World, a single example in the British Museum; at any rate a book of extreme rarity.

interest in scientific pursuits. ¶ It may be added The ~~Earle~~

¶ The McGill libraries possess practically all the important treatises on bird life in America prepared by ~~the famous~~ John James Audubon (1780 – 1851). This famous naturalist was born in Santo Domingo, his father being John Audubon, a French naval officer. The boy was taken to France, where he attended a military school and for a brief period studied drawing; then he came to America. A year spent on his father's farm near Philadelphia in hunting and painting birds proves a good introduction to his future career. A chequered period followed attempts to repair his father's financial losses in the West Indies but on the whole these efforts were unsuccessful and had it not been for the devotion and assistance of his wife, Lucy Bakewell Audubon, we would probably never have heard of the artist. She practically supported the family and encouraged Audubon to travel to Europe and about America getting subscriptions for his new world-famous atlas, Birds of America. After the publication of the text for the plates he returned to the home of his adoption and brought out additional works on faunal life, including (collaborating with Bachman, father-in-law of his two sons) a work on American Quadrupeds. ~~Practically all the Audubon atlas, with variants) are on the McGill library shelves.~~

¶ The library copy of his first and most important work, the remarkable Birds of America, ¶ issued in "elephant" folio style, 1827-38, (is a subscription copy) purchased for the general library by 100 merchants of Montreal in 1860. This gift, in its original covers, contains a roster of the donors, that forms a roster of the best known citizens of the day in that Canadian city. The gift shows not only their local interest taken in the University but proves their intelligent interest in scientific pursuits. ¶ It may be added The Bride

Format

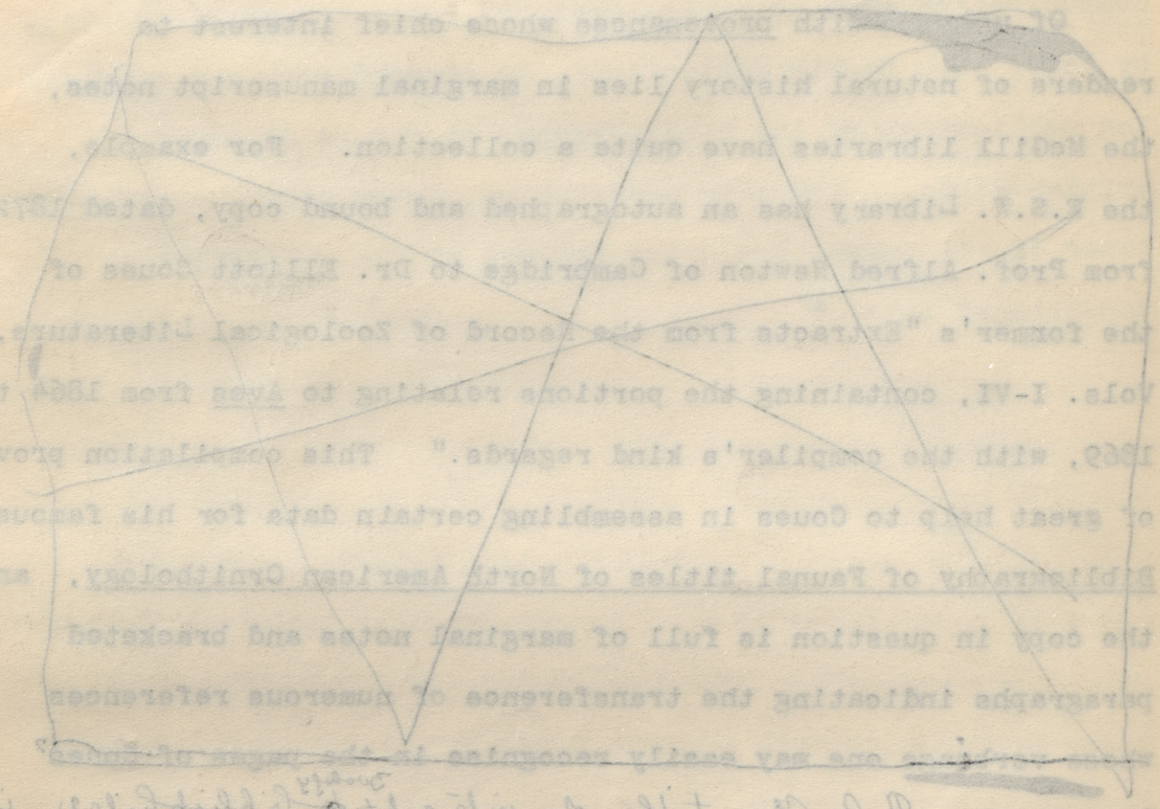
of the original atlas resulted from Audubon's desire to reproduce ~~in natural~~ life-size portraits of ~~as near as possible~~ all the birds he painted and, as the male Wild Turkey required "double-elephant" folio sheets, all the plates were published of that size. When these imposing series (435 hand-colored plates, 1065 life-sized figures of 489 supposed species of birds) were exhibited in Edinburgh they became the talk of the town, as they were really the first attempts to reproduce in print birds ~~in their~~ painted from nature, in their natural poses and provided with sylvan backgrounds and surroundings ~~such as they commonly preferred~~. ¶ The ~~first~~ library copy of the first octavo edition (1840-44) has inscribed on a blank title page the following interesting note: "Montreal, L.C., Sept. 29/42. It is with delight and the most grateful sentiments of my poor heart towards you that I subscribe myself as your sincere friend and servant, John. J. Audubon. To Frederic Griffin, Esq. Montreal, Canada".

¶ As every student of the literature of American ornithology knows, Elliott Coues' Instalments were intended as a prelude to a "Universal Bibliography of Ornithology". In this connection one is reminded that, ~~as every one knows,~~ Coues was under considerable obligation to his friend Professor Alfred Newton, of Cambridge, England, for assistance, advice and encouragement in the preparation of his Bibliography. One of the treasures of the E.S.W.Library of Ornithology in McGill University is an autographed copy from Newton to Dr. Elliott Coues, "with the compiler's kind regards", in 1872, of "Extracts from the Record of Zoological Literature", Vols. I-VI, containing the portions relating to Aves from 1864-1869." This compilation proved of great help to Coues in assembling data for his great work; and the copy in question is full of his marginal notes and bracketed paragraphs indicating the transference of numerous references whose verbiage one may readily recognize in the pages of the Instalments. ¶ The Blacker Library possesses ~~This~~ ample evidence that when Coues decided he would be unable to finish the work so happily and successfully begun he did his best to engage the activities of others to that end. ~~Another~~ The account of one of these efforts - that unfortunately ended in failure - is in the form of a letter ~~that came into my possession with~~ accompanying a presentation copy by the author of the Instalments "to his friend W. Ruskin Butterfield". This

communication refers to an arrangement made two years before his death by Coues with Ruskin Butterfield to proceed with and complete the publication of the Bibliography, so far as it concerned British Birds. For this undertaking, Coues offers every assistance in his power, including the use of his collection of unpublished notes.

Of volumes with provenances whose chief interest to readers of natural history lies in marginal manuscript notes, the McGill libraries have quite a collection. For example, the E.S.W. Library has an autographed and bound copy, dated 1872, from Prof. Alfred Newton of Cambridge to Dr. Elliott Coues of the fommer's "Extracts from the Record of Zoological Literature, Vols. I-VI, containing the portions relating to Aves from 1864 to 1869, with the compiler's kind regards." This compilation proved of great help to Coues in assembling certain data for his famous Bibliography of Faunal titles of North American Ornithology, and the copy in question is full of marginal notes and bracketed paragraphs indicating the transference of numerous references ~~whose verbiage one may easily recognise in the pages of Coues' Instalments~~. Another title of interest to Zoology bibliophiles is the Godman copy of that rare serial, Sir William Jardine's Contributions to Ornithology, 1848-53, 5 vols. with 101 col. pl. — in the Blacker Library. Two of the volumes have laid in an A.L.S. from Jardine on matters connected with the Contributions.

The E.S.W. Library has also an incomplete set with the original ~~dated~~ covers, the latter with MS. notes dealing with the difficult and disputed questions of the dates of publication. It may be added that the ~~dates~~ dates on the covers are quite misleading and throw little light on the ~~publication~~ actual month or year of publication.



second copy
not corrected

¶ Among rare and interesting volumes in the E.S.W.Library is a unique variant of the edito nova (1809) of John Latham's well known Index Ornithologicus. The appended notes to that title were written for the present Catalogue at the Compiler's request by Dr. Charles W. Richmond, from whom the Compiler was able to secure the copy — truly a bibliographical curiosity. It is of particular interest, adds Dr. Richmond, on account of the many manuscript corrections and explanations. At the end of the work are what appears to be two printed title pages, one in French and the other in Latin, both dated M.DCCC.lX, and both differing from ordinary copies. There are MS corrections on each, with autograph additions by the hand of Milne Edwards (from whose library it was purchased) that include references to the pages where he had "notes de moi".

A description of this unique volume, and giving its history, are notes in French (tallying with Dr. Richmond's annotations) in the handwriting and signature of the first owner and editor, Eloi Johanneau. These MS notations begin "Ex lib. Eligii Johanneau". The first of the (front) double title-pages was later pasted in (teste "Anno X11") doubtless to satisfy the regulations of the French (Republican) Government. There is also a "Préface de l'Éditeur" (pp. X111 - XV1) bound in at the end with various MS corrections; P.X11 consists of "emendanda", continued on pp. X111 and X1V, with a praefatio auctoria on pp. XV - XV1. At the end are 3½ MS pages bound in. The "Préface" is subscribed "Paris, ce 15 Juillet, 1809,"

Eloi Johanneau." The "Praefatio" is abbreviated from the Index Ornithologus of Latham. ~~The following is the full text~~

¶ The library copy of the rare Compendium of the Ornithology of Great Britain, written by John Atkinson in 1820, belonged to Sir William Jardine, who made the following notation on a blank fly leaf : "This copy of Atkinson belonged to William Yarrell, and was purchased at the Sale of his Library, 15th. Novr. 1856 for £1. 1. 0. All the notes in pencil throughout the vol. are Mr. Yarrell's. - Wm. Jardine."

¶ Of volumes that are ~~scarcely~~ rarissima ~~and~~ whose possession is due ~~solely~~ mostly to persistent search ~~and diligence~~ and the expenditure of dollars the McGill libraries have the usual share. The evaluations in the appended Catalogue generally note unusual or scarce items but a few of the more noteworthy items may be mentioned ~~in this list. The~~ here. One of these is the original edition of William Turner's Avium precipuarum ... apud Plinium et Aristotelem, etc., a small octavo printed in 1544, at Cologne; ~~and translated (1903) with notes by A.H. Evans~~ a well preserved example is among the treasures of the Blacker Library. ~~A copy~~ This title is marked "wanting" in the Cat. Br. Mus., 1915, and it is undoubtedly a very rare little classic. ~~It has been~~ There is a translation of this book by A.H. Evans, ~~and~~ published in 1903.

¶ A very rare (no copy in the Br. Mus. Nat. History, ~~nor in~~ nor in the major library the Smithsonian) little ~~Canadiana~~ Canadiana is Sir James Lemoine's Tableau synoptique de l'ornithologie du Canada, 1864, published in Quebec. The only other copy known to the Compiler besides that in the E.S.W. Library is a (better) example in the library of the National Museum at Ottawa.

~~three~~

¶ In the Blacker Library are several ~~rare~~ extremely rare copies that ~~the~~ opus magnum, the De Proprietatibus Rerum of the Minorite,

→ Bartholomaeus Angelicus, ~~fl. 1250?~~ who flourished about 1250 A.D.

The earliest is ~~of~~ is dated 1481 A.D. and may be described as follows:

~~1481. De Proprietatibus Rerum.~~ ↴ Gothic letter, 456 ll. the first and last blank, first initial of each book supplied in red, green and mauve, other initials and paragraph marks in red, rubricated throughout, stamped morocco, g.e. by Riviere. fol. Cologne. Johann Koelhoff.

[611a]

This is the second Cologne edition. The first one, was issued in 1472, ~~and~~ having been printed ~~was set up from the first editions printed~~ in that town by the famous English printer Caxton. ~~Caxton, about nine years earlier.~~ Its author, professor of theology in the University of Paris, should not be confused with Bartholomew de Glanville, (like our author an English minorite monk) who lived about 1360 A.D. The copy in hand is a remarkably fine and clean example, wanting only two blank leaves.

A previous owner of this Blacker Library copy has written in the following comments :- "The book before us is no doubt one of the earliest specimens of Caxton's art, although it is issued to the public as a work of Koelhoff.

Caxton, on the termination of his apprenticeship to a merchant or mercer in London, in 1442, went into the Low Countries, either on his own account or as the agents of some merchants, and resided abroad for thirty years.

Whilst there he studied the art of printing on the premises of Koelhoff during which time he was assisted by Wynkyn de Worde, a native of Lorraine.

The first specimens of their craft were the present publication, "The Game and Play of Chesse", etc., several of them not being actually issued until some years afterwards and then without date or place.

Caxton returned to England in 1472, afterwards going back and forth to the Continent, the first book printed in Westminster bearing date 1477. It was during these migratory visits that he began and finally completed the "Bartholomaeus", which he left with his friend and instructor Koehlhoff, to be published by him under his own name, whenever he chose. It was not until three years afterwards that Koehhoff presented to the world this magnificent edition of ~~this~~ an extraordinary work.

The first English edition of the work was published by Wynkyn de Worde, and is one of the rarest and most magnificent volumes that issued from his famous press.

It is from one of the leaves of his translation that we quote the authority [redacted] attributing the printing of this Latin version to Caxton. In the "Prohemium Bartholomei de Proprietatibus rerum" - a series of introductory verses - he thus writes:-

Whilst there he studied the art of printing on the premises of Koelhoff during which he was assisted by Wynkyn de Worde, a native of Lorraine.

The first specimens of their craft were the present publication, "The Game and Play of Chesse", etc., several of them not being actually issued until some years afterwards and then without date or place.

Caxton returned to England in 1472, afterwards going back and forth to the Continent, the first book printed in Westminster bearing date 1477. It was during these migratory visits that he began and finally completed the "Earthlomaeus", which he left with his friend and instructor Koelhoff, to be published by him under his own name, whenever he chose. It was not until three years afterwards that he presented to the world this magnificent edition of his extraordinary work.

The first English edition of the work was published by Wynkyn de Worde, and is one of the most magnificent volumes that issued from his famous press.

It is from one of the leaves of his translation that we quote the authority attributing the printing of this Latin version to Caxton. In the "Prohemium Earthlomei de Proprietatibus rerum" - a series of introductory verses - he thus writes:-

"and of your charity call to remembrance the soul of William Caxton, first printer of this book in Latin tongue at Cologne, himself to advance that every well disposed man may therein look."

¶ In the Osler Library is a somewhat later ~~still earlier~~ edition, printed ~~[illegible]~~ at Lyons. Its formal description is as follows:—

¶ The first English translation was made by John of Trevisa for Sir Thomas Berkeley in 1397, and it was printed in London in (or about) 1495 by Wynkyn de Worde.

In the edition of 1495 the English names of the birds appear in the first paragraph of a chapter instead of at the head with the one Latin name.

Of the nineteen books into which the work is divided, Book XII is devoted first to "De Avibus in generali", followed by accounts of "Aquila, or Egle"; "Ancipitre, or Gosehauke"; "Alieto" [= Sparrowhawk?]; "Apibus, or Bees"; Bubo, or Owle"; Columba, or Culuour" [= Dove]; "Coturnia, or Curlewe"; "Ciconia, or Storke"; "Cornix, or Crowe"; "Corvo, or Rauen"; "Cigno, or Swanne; "Culix, or Gnatte" [the fly]; "Cicada, or Grasshopper"; "Fenix" [= Phoenix]; Grus, or Crane"; "Gallus, or Cocke"; Gallinaceo, or Capon"; "Gallina, or Henne"; "Grype" = [Griffon]; "Herodius, or Faucon"; Hirundo, or Swalowe"; "Kaladrius" (?); "Larus" [a gull]; "Locusta" [locust]; "Mergulus, or Cote"; "Milvus, or Kyte"; "Nicticorax, or Nyghte Crowe"; Onocrocalus, or Myre-drumble"; "Pellicane"; "Perdix, or Pertriche"; "Pavo, or Pecoke"; Passeres, or Sparrowes"; Strucio, or Ostriche"; "Turture"; "Vulture"; "Ulula" [= Bittern]; Upupa, or Lapwynge"; Vespertilio, or Remouse" [the bat].

See, also, the English translation, 1582, in this ~~Library~~ Catalogue.

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¶ A collation of the (first) Spanish edition ~~is assigned~~ from a copy in the hands of Maggs Bros. is the following.

18th. Sept., 1494. De las Propriedades de las Cosas. El libro de proprietatibus Rerum en Romance.

Folio. Gothic letter, double columns of 46-47 lines. With the woodcut Arms of Spain, sixteen large woodcuts and a large woodcut printer's device on a black ground. Woodcut initial letters. Head-lines. Rarissima.

Toulouse, Henri Mayer, 18th. September.

Hain 2523 (without seeing it). Proctor 8722. Pellechet 1887.

Forty-six ~~[illegible]~~ leaves (gg1-mm8), including the entire Book XVII, 87 pages, "De Los Animales", from the above edition, ~~the first in Spanish, of Bartholomew the Englishman's Encyclopedia, compiled in the early thirteenth century.~~ The book describes 110 animals, and is preceded by several pages relating to animals in general.

¶ Of this extremely rare incunable McGill has only a portion, presented to the Library of the Medical Faculty by Maggs Bros., London. This excerpt comprises 13 ff. which include the complete Book III, Del Anima, treating the several Senses. Beginning on the verso of (script) folio 24 is a discussion of Vision - Del sentido dela vista, illustrated by two woodcuts in the text.

A collection of the (first) Spanish edition incorporating
from a copy in the hands of Maggs Bros & the following.

18th. Sept., 1494. De las Proprietades de las Cosas. El
libro de proprietatibus Rerum en Romance.
Folio. Gothic letter, double columns of 46-47 lines.
With the woodcut Arms of Spain, sixteen large woodcuts and
a large woodcut printer's device on a black ground. Woodcut
initial letters. Head-lines. Remarkable.
Toulouse, Henri Mayer, 18th. September.
Hain 2525 (without seeing it). Proctor 8722. Pellechet 1887.
Sixty-six leaves (8½-4mm8), including the entire Book XVII, 87
pages, "De Los Animales", from the above edition, the
first in Spanish, of Bartholomew the Englishman's Encyclo-
pedia, compiled in the early thirteenth century. The book
describes 110 animals, and is preceded by several pages
relating to animals in general.
Of this extremely rare incunable McGill has only a portion
presented to the Library of the Medical Faculty by Maggs Bros.,
London. This excerpt comprises 17 ff. which include the complete
Book III, Del Animo, treating the several Senses. Beginning on the
verso of (soript) folio 24 is a discussion of Vision - Del sentido
de vista. Illustrated by two woodcuts in the text.

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A Facsimile of the general title to the volume is prefixed, and on the verso of the leaf is drawn a fifteenth century ~~woodcut~~ picture of the crucifixion, which does not appear in the original volume.

The Compiler had the whole bound (in imitation of contemporary binding) by Zaehnsdorf, and ~~[illegible]~~ forwarded the volume, thus embellished, to the Medical Library.

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(in the Blacker Library)

¶ The collation of the second English edition reads as follows: —

~~Bartholomæus Anglicus, fol. 1535~~

De Propriatatibus Rerum. (In English). Black letter, double columns of 50 lines. 1535 A.D. London. Thomas Berthelet. Second edition in English. Sm fol. Fol. 226 misplaced. Very rare. Lowndes regards (Vol. II, 898) this edition as the chef-d'oeuvre of Berthelet's press.

The translation is that of John of Trevisa, made at the request of Thomas Lord Berkeley in 1398. ~~It was first printed in England by Wynken de Worde in 1495.~~ Berthelet's is the second edition in English. ~~The earliest edition in Latin was either the one printed at Basle about 1470-71, or that printed at Cologne about the same time.~~ This famous work is a compilation in nineteen books from various departments of human knowledge, and was the encyclopedia of the middle ages. ~~The surname De Glanville is usually, though erroneously, given to Bartholomæus Anglicus.~~ Berthelet's device is only found in a few copies (missing in this instance), the others having the last page blank, and very often the last leaf containing it is wanting altogether.

De Proprietatibus Rerum. (In English). Black letter, double columns of 50 lines. London. Thomas Berthelet. Second edition in English. Sm fol. Vol. 226 misplaced. Very rare. Lowndes regards (Vol. II, 892) this edition as the chef-d'oeuvre of Berthelet's press.

The translation is that of John of Trevisa, made at the request of Thomas Lord Berkeley in 1398. Berthelet's is the second edition in English.

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¶ The title of another English print is

Batman uppon Bartholome, his Booke De Proprietatibus rerum; tr. fr. the Lat. by John de Trevisa. Folio. London. T. East. fol. 86-425. 1582.

The work begins with Bk. 7 De infirmitatibus, and ends with Bk. 19 De Instru. musicis.

¶ The copy in hand includes the zoological portion, translated by Stephen Batman. It is an extremely rare edition; ~~printed in London, 1582~~ this copy, in the Blacker Library, has been carefully compared with the British Museum copy, and found to agree with it.

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¶ Still another *rarissima* is Paul Barthez's

~~Barthez, Paul Joseph (1734-1806)~~

~~6.~~ Nouvelle mechanique des mouvements de l'homme et des animaux, ~~Pp. 16 + 245~~ of 262 pages, published at Carcassonne in 1798. It is a ~~a rare~~ scientific contribution to a study of aerial flight. In the last three propositions of the first section (Pp. 43-48) the bipedal posture of the bird at rest is considered. The sixth section (Pp. 190-245) is a treatise on the flight of birds. This work is of historic importance for aviation, following upon that of Borelli in the seventeenth century.

(unica)
B 611 i

¶ Another treasure of the Blacker Library is a manuscript of 44 large octavo pages by Sir Joseph Banks, written in his own hand and giving an account of his Voyage to Iceland in 1722, after his return from the journey round the world with Captain Cook. This scientific survey of the polar regions was undertaken at the request of Lord Sandwich, First Lord of the Admiralty. Banks was on that occasion accompanied by Dr. Solander and several assistants whom he engaged at his own expense.

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¶ A rare and important item for Zoologists is, J. P. A. Leisler's Nachtraege zu Bechsteins Naturgeschichte Deutschlands, two parts, 1811–15 (all pub.). The library of the London Zoological Society is the only British collection — there is a copy in the Field Museum, Ayer collection, at Chicago — so far as the Compiler knows, with both parts complete. The E. S. W. Library is glad to have Heft I; Heft II treats of bats.

¶ An interesting copy of the rare (Dutch) first edition of Georg Rumpf's Amboinsche Rariteitkamer, Amsterdam, 1705, is in the Blacker Library. It is provided with an extra engraved t. p. and furnishes one of the best and earliest accounts of marine life in the seas of Amboyna.

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A

¶ The following collation describes another rare treasure in the Blacker Library.

Anonymous.

1551. Contrafactur aller vierfüssigen Thier-Eygentliche und gantz artliche contrafactur (4 lines).

¶ (Colophon:) Getruckt zu Strassburg durch Balthassar Becken Erben DMLI. Sm. fol. Gothic letter. 32 leaves, 61 large, virile woodcuts (5 3/8 x 4 1/8 ins.) of animals. Bound by Riviere. No letterpress except full page title and names of animals. On the recto of first leaf, in script by a contemporary hand: "Franciscus Rossius Noëus, Chirurgus paris, 1551."

Excessively rare, not in British Museum, nor listed by Banks, Brunet, Graesse, nor is it in the Catalogus Bibliothecae historico-naturalis.

¶ Another rare treatise of 356 folios, ~~title, to be found in the~~ not listed in the Nat. Hist. Cat. of Br. Mus., is Jacques Le Fèvre's Paraphrases, 1521 A.D. This ambitious work endeavors to furnish in one volume all the fundamental knowledge known to date on natural philosophy.

¶ Among the rarities, mainly the result of limited ~~ed~~ numbers and private printing, is T. W. Blakiston's Amended List of Birds of Japan. There is no copy in the Br. Mus. Nat. Hist.

Anonymous.

1551. Contrafactur aller vierfüssigen Thier-Eygentliche und gantz artliche contrafactur (4 lines).

(Colophon:) Getruckt zu Strassburg durch Balthasser Beckenn Byron DMLI. 8m. fol. Gothic letter. 32 leaves, 61 large, virile woodcuts (5⅝ x 4⅝ ins.) of animals. Bound by Riviere. No letterpress except full page title and names of animals. On the recto of first leaf, in script by a contemporary hand: "Francisca Rosalia Noëua, Chirurgus paris, 1551."

Exceedingly rare, not in British Museum, nor listed by Banks, Brunet, Graesse, nor in the Catalogus Bibliotheca historico-naturalis.

612 b

¶ Another McGill library rarity is listed in the Catalogue as:

1720? Miscelania curiosa de avibus. Of birds. Pp. 122. 95 pl. sq. 8vo.

Mss. in English and Latin with original drawings of English and American birds.

¶ This curious manuscript describes, with the help of Ray's Synopsis and other contemporary sources (quoted by the unknown author and artist) over 200 species, with colored drawings of 98. It is in the E.S.W. Library and may be of interest to research scholars. Internal evidence indicates its production in the beginning of the eighteenth century.

1720? Miscelania curiosa de avibus. Of birds. Pp. 152. 95 pl. 4o. 8vo.

Mss. In English and Latin with original drawings of English and American birds.

This curious manuscript describes, with the help of Ray's Synopsis and other contemporary sources (quoted by the unknown author and artist) over 200 species, with colored drawings of 98. It is in the E.S.W. Library and may be of interest to researchscholars. Internal evidence indicates its production in the beginning of the eighteenth century.

¶ A number of interleaved copies with copious notes and marginal additions – evidently in preparation for ~~editions~~ an editio altera, that may or may not have been published – are in the McGill libraries. These unique items have something more than a passing interest and value and are regarded by the Compiler as worthy of record.

Here one may mention James Backhouse's Handbook of European Birds, 1890. The library copy is interleaved and prepared for a second edition which, so far as the Compiler knows, was never published. The original edition ~~work itself~~ is quite rare, no copy being noticed ~~entered~~ in the Cat. Br. Mus. (Nat. History) nor in the Zimmer Cat. of the Ayer Library, Chicago.

In the E.S.W.Library is the following title :- L.P. Vieillot, 1816, Analyse d'une nouvelle Ornithologie élémentaire. 8vo., pp. 70+ 1. Paris.

This is the rare editio princeps of a small but extremely important volume reprinted by the Willughby Society. The present copy bears the signature of A. Milne Edwards and was auctioned off at the sale of his library. There is a very neatly hand-printed list of "errata" at the end, which, in the opinion of Dr. Chas. W. Richmond, through whom the E.S.W.Library was able to acquire the item, and to whom the Compiler is indebted for the following notes, These are mostly taken from the Nouv. Dict. d'Hist. Nat. (?Vol. XXIV) or from some other of the author's writings of 1817 or 1818:- "There are about 120 new genera proposed in the present work as well as 16 new species. See, also, Mathews Birds of Australia, Supplt. No. 5. The author tried to publish this work for two or three years before it finally came out. In spite of Vieillot's industry and activity, not to mention originality, some people tried to give him a black eye, and Temminck even published a pamphlet (Observations sur la classification méthodique des

Oiseaux, et remarques sur l'analyse d'une nouvelle Ornithologie élémentaire par L.P.Vieillot', dated 1817 ~~[illegible]~~ in which he ~~[illegible]~~ answers Vieillot," ~~if I remember correctly, but I cannot find the tract at this time. I think he also claims that the "Analyse' appeared late in the year, though we have established its date as April, about the 14th."~~

Taking them at random, two very rare titles (neither of which appears in the Cat. Nat. History Br. Museum) in the Blacker Library are Graefe and Naumann's Handbuch der Naturgeschichte des Tierreichs, 1836, and A. J. Lottinger's Histoire du Coucou d'Europe, 1795.

As is the case with all large libraries of natural history of the New World the McGill collections are ill-supplied with manuscripts and are especially defective in codices written before the invention of printing. The Compiler may therefore be excused if he quotes at some length descriptions of three Persian treatises on zoology, one of which, perhaps two, ~~[illegible]~~ were copied before 1450 A.D.

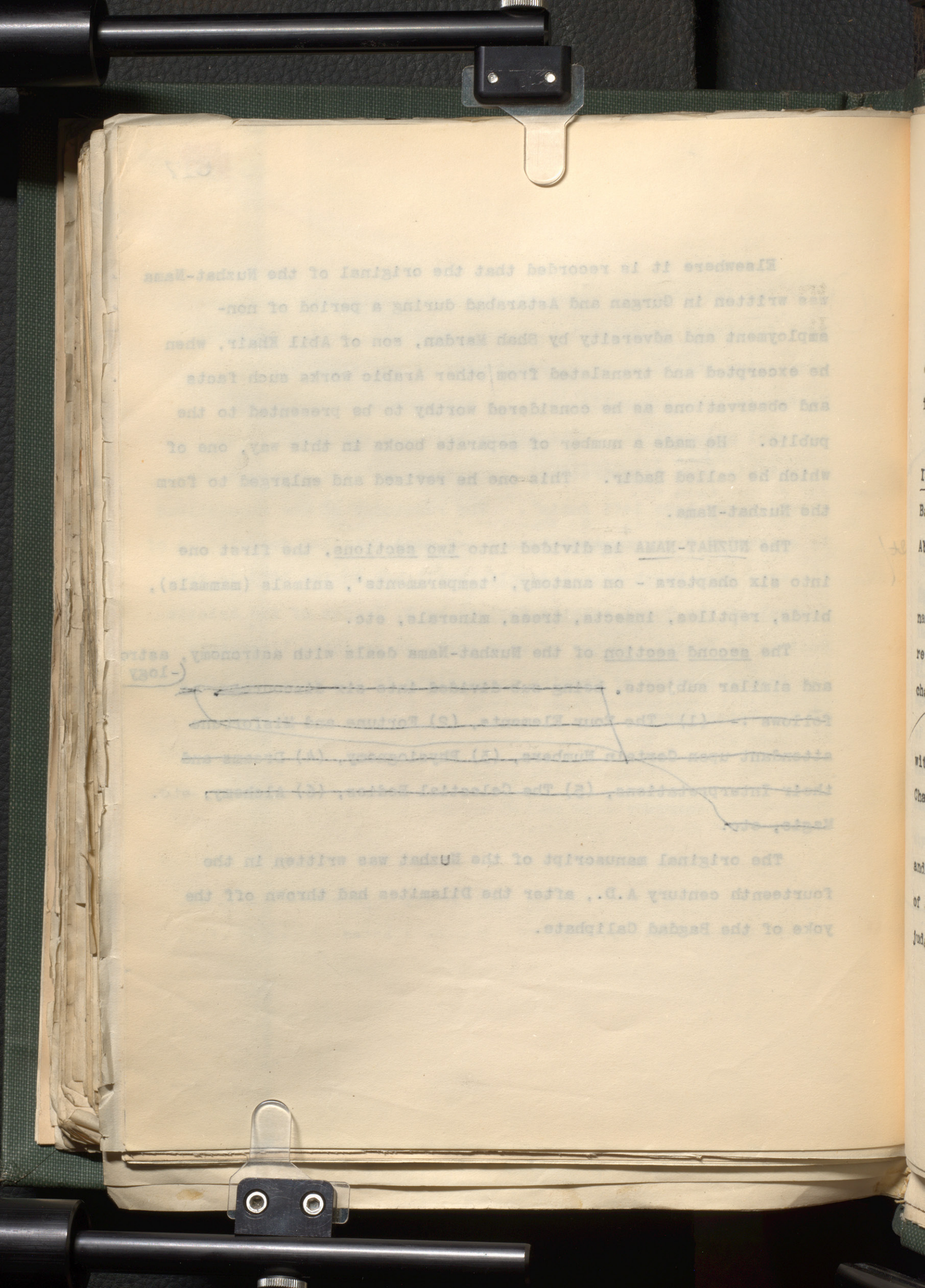
The introductory notes on these extremely rare treatises were furnished by Colonel H. Murray of Simla, India, in whose possession the three manuscripts were at one time, and by Professor Syed Azhar Ali, M.A., a well-known authority on oriental manuscripts. The latter believes the three works, with their ~~rare~~ fine illustrations, constitute a "rare treasure that should never have left India". The remainder of the annotations is extracted from ~~the much longer and more~~ a detailed description of the very rare Farah-nama-i-Jamali, published during 1929 in the Journal of the Royal Asiatic Society by W. Ivanow of the Asiatic Society of Bengal, author of many works on oriental literature and former curator of Persian manuscripts in the Imperial Library ~~at~~ of St. Petersburg.

Elsewhere it is recorded that the original of the Nuzhat-Nama was written in Gurgan and Astarabad during a period of non-employment and adversity by Shah Mardan, son of Abil Khair, when he excerpted and translated from other Arabic works such facts and observations as he considered worthy to be presented to the public. He made a number of separate books in this way, one of which he called Badir. This one he revised and enlarged to form the Nuzhat-Nama.

The NUZHAT-NAMA is divided into two sections, the first one into six chapters - on anatomy, 'temperaments', animals (mammals), birds, reptiles, insects, trees, minerals, etc.

The second section of the Nuzhat-Nama deals with astronomy, astro-logy and similar subjects, ~~being sub-divided into six discourses, as follows :- (1) The Four Elements, (2) Fortune and Misfortune attendant upon Certain Numbers, (3) Physiognomy, (4) Dreams and their Interpretations, (5) The Celestial Bodies, (6) Alchemy, Magic, etc.~~

The original manuscript of the Nuzhat was written in the fourteenth century A.D., after the Dilamites had thrown off the yoke of the Bagdad Caliphate.



The small, second work in the collection is a separate treatise of 10 pages written by Ibrahim, son of Abdul Jabbar. It deals mostly with botanical subjects, and is probably an original treatise. At least no name is entered as copyist, and it is without date.

The third work in this bound volume is entitled FARRUKH-NAMA-I-JAMALI. It was written in A.H.899 (about 1519 A.D.) by Abu Bakr, son of Muzhar, son of Muhammed, son of Abul Casim, son of Abi-Said-il-Jamal, known as Yazdi (citizen of Yazd).

The author states that while it is largely a compilation of natural science, none of the contents of the Nuzhat-Nama have been repeated. The compend appears in two parts, each subdivided into chapters.

Chapter I of the first section deals with anatomy; Chapter II with mammals; Chapter III with birds; Chapter IV with reptiles; Chapter V with the vegetable kingdom and agriculture.

Chapter I of the second section deals with the four seasons and their relation to the sky, space and time; Chapter II treats of arithmetic, astrology, logic, accounts, and the decisions and judgments of Ali, the Fourth Caliph and son-in-law of the Prophet.

Like the second treatise, this work is certainly an original manuscript. There is no mention of the copyist, but it was evidently written to supplement and bring up to date the information supplied by the other two monographs. Also, no date is given of any copy.

Mr. Ivanow, in his report on the Farah-Nama-i-Jamali notes that until recently "only one copy of the work was so far known, viz., in the library of the British Museum; it is slightly incomplete at the end, as described by C. Rieu, in his Catalogue of the Persian Manuscripts, Vol. II, pp. 465-66. Not long ago, Dr. Casey A. Wood, the well-known ornithologist, a professor of Stanford University, while on a tour in Kashmir, acquired another copy of this rare work, bound in one volume with the Nuzhat-nāma-i-Alā'ī, and a fragment of another work in the same style."

X. A Vienna MS. (No. 1449 in Flügel's Catalogue) contains some extracts from this work.

These three quite unique Persian manuscripts, all dealing with Natural Science, are bound together in ~~this~~ one (original) cover.

The first manuscript is entitled NUZHAT-NAMA-I-ELIA, or "ALLA'S BOOK OF HAPPINESS", the name of the Patron to whose order the original manuscript was written being Alla-ud-Daula.

There are only three known complete copies of this work, one in the Bodleian Library at Oxford, one in the Ducal Library at Gotha and the present copy.

The present manuscripts are elaborately illustrated with hundreds of colored drawings in the best style of the fifteenth century, a circumstance that greatly anhances the scientific, artistic, literary and, one may add, the commercial value of the collection.

Illustrated manuscripts of Arabic and Persian medieval works dealing with natural history, accompanied by ~~with~~ drawings of the best artists of ~~the~~ the period, are of the greatest rarity.

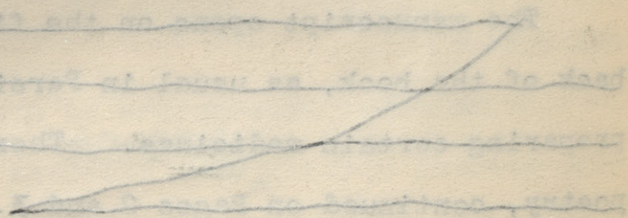
Without doubt it was the intention of the naturalist who wrote the third section of this collection, and who is responsible for the whole, to bring together all that was known in his day of natural history. To that end he adopted, first of all,

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the correct plan of reproducing in toto what he regarded as (and what probably was) the most authentic work on the general subject. With this he incorporated a few additional, original pages by a second author and, finally, he supplemented these works, one original and the other a more extensive but published monograph, by his own contributions taken from various sources, but contriving as far as possible not to duplicate the observations of the other two writers.

The colophon records that the copying of the first work - the NUZHAT-NAMA- was completed on Sunday, the 9th. of Rabinawwal, Anno Hegirae 807, i.e. about 1427 A.D., and that the copyist was Ali son of Mahmud, son of Mahammud Suruamed Sayingh, of Shiraz.

~~The manuscript opens on the first page (reckoning from the back of the book, as usual in Persian script) with directions for preparing certain medicines. There is also a quatrain of Persian poetry, continued on Pages 2 and 3.~~ The third page shows the seal of Mahabat Khan, Commander-in-Chief in the reign of Emperor Jahingir, and records the fact that the book formed part of the library of the former's son, Aman-ullah Khanazad-Khan-Feroz Jung.



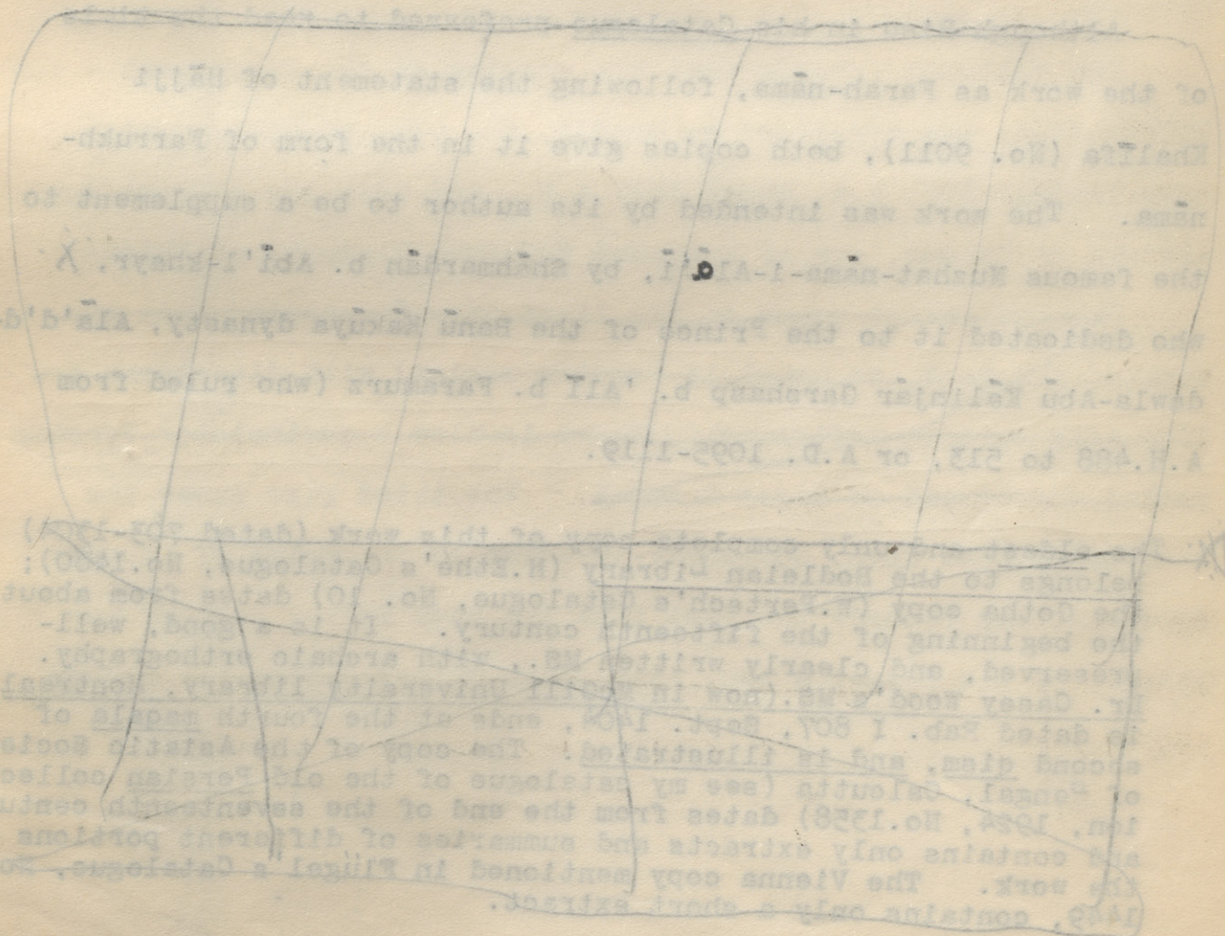
622
and
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This copy contains numerous illustrations, and is almost complete, except for one short lacuna. It was completed on Muharram A.H. 899, i.e. the 15th. October 1493.

The transcript not only contains the last two chapters, missing in the British Museum copy, but also gives very interesting variants of the latter, especially in the passages relating to the date and the place of its composition.

Although Rieu in his Catalogue preferred to read the title of the work as Farah-nāma, following the statement of Hājji Khalīfa (No. 9011), both copies give it in the form of Farrukh-nāma. The work was intended by its author to be a supplement to the famous Nuzhat-nāma-i-Alā'ī, by Shāhmardān b. Abī'l-khayr, who dedicated it to the Prince of the Banū Kākūya dynasty, Alā'd'd-dawla-Abū Kālinjār Garshasp b. 'Alī b. Farāmurz (who ruled from A.H.488 to 513, or A.D. 1095-1119.

The oldest and only complete copy of this work (dated 703-1304) belongs to the Bodleian Library (H.Ethé's Catalogue, No.1480); the Gotha copy (W.Pertsch's Catalogue, No. 10) dates from about the beginning of the fifteenth century. It is a good, well-preserved, and clearly written MS., with archaic orthography. Dr. Casey Wood's MS.(now in McGill University library, Montreal) is dated Rab. I 807, Sept. 1404, ends at the fourth maqala of second qism, and is illustrated. The copy of the Asiatic Society of Bengal, Calcutta (see my catalogue of the old Persian collection, 1924, No.1358) dates from the end of the seventeenth century, and contains only extracts and summaries of different portions of the work. The Vienna copy mentioned in Flügel's Catalogue, No. 1449, contains only a short extract.



¶ The student who is interested in oriental zoologica rarissima must not fail to read also the chapter on oriental literature where, in addition to the books just mentioned, ~~here as originating in the Far East~~, are described several of great interest, some of them extremely rare. ¶ An almost unique title (in the Blacker Library) is the first edition of G. A. Borelli's De Motu Animalium, 1680-1, wherein is described, for the first time in print, an explanation of bird flight based on the theory of the lever and aerial resistance. Even subsequent editions are rare; the editio princeps is not catalogued in any library consulted by the Compiler.

¶ A very rare zoological item (in the Blacker Library) is the original edition of Scopoli's Deliciae Florae et Faunae Insubricae, 1786-88, the ornithological part of which was reprinted by the Willughby Society in 1882.

In the Blacker Library, also, is the original manuscript (beautifully written), the plates and portraits of Antoine Fée's well-known Vie de Linné, 1832, probably the best of the French biographies of the great Linnaeus, ~~especially as it was written by a learned and sympathetic naturalist.~~ The illustrations of this manuscript are fresh and clear - probably first states of the plate - and the volume in hand establishes the fact that it was really ready for the printer in 1831.

¶ One of the most interesting and among the most valuable of the manuscripts in the Blacker Library is one of 46 folios by Isidore Geoffroy Saint-Hilaire, dated 1833, entitled Considérations sur les caractères employés en ornithologie etc, an original essay on the classification of birds.

¶ Of considerable interest is a manuscript copy, dated 1808, (Blacker Library) of Dame Juliana Berners' Treatyse of Fysshynge wyth an Angle, 1496, – that rare Wynken de Worde item, by the hand of Sir H. Ellis, Chief Librarian of the British Museum who, more than a century ago, carefully copied the excessively scarce original with his own hand. in the E.S.W. Library

Of interesting and unique volumes unique because of a provenance, mention may be made of Jerdon's copy of Prince Bonaparte's Conspectus generum avium. It is interleaved and Dr Jerdon has made on the blank pages many manuscript notes.

As previously stated, of

volumes with provenances of interest to naturalists and collectors - presentation copies, correspondence and other manuscripts bound in, added drawings or plates etc., - the libraries have their share. One example that occurs to the Compiler is an autograph letter, dated September 30th.1861, from Dr. Jerdon to Edward Blyth regarding the latter's work on Indian Zoology. It is bound with Blyth's Catalogue of the Birds in the Museum of the Asiatic Society, 1849. ¶ Quite a rare item, Pedro Blanchard's Birds of Portugal (Thesouro de meninos, 1517-19) is represented in the Blacker Library (no copy in London libraries) by a copy formerly in the Royal Library with the Portuguese arms stamped on the cover.

Another unique provenance in the manuscript additions by the author to the E.S.W. Library copy of Vieillot's rare Analyse, 1816, from the Milne-Edwards library.

Of perhaps minor importance but still interesting are such volumes as a presentation copy of the seventh edition of Carpenter's Microscope, 1861-65, which the editor (W.H.Dallinger) has used as a scrap book for appropriate newspaper clippings.

~~(Lady E. Gwillim's paper now being copied and typed).~~

A provenance that approaches the historical is found in a Blacker Library incunabular copy of Pliny's Natural History, (1483) that belonged to Laurentius Burellus. It contains his coat-of-arms, a manuscript verse and notes relating to the contents of this rare folio.

Very rare but interesting items are Bewick's Chap Books of Natural History. These little tractates were published by the great (wood-cut) illustrator and placed on sale at Alnwick, about 1827, for popular consumption. The E.S.W.Library possesses seven of these curiosities, with the cuts well-preserved and the text clear.

Every American zoologist is interested in the publications of Alex. Wilson, most of which are in the McGill Libraries. A very scarce variant of the 1853 printing (T.M.Brewer, ed., H.S. Samuels, pub.) of American Ornithology is ~~published~~ the publication by Magagnos and Co., N.Y., a word-for-word copy of the 1840, 1853 and 1854 issues except that it is prefaced by a major, colored and gilt title whose verbiage has been slightly altered. It is merely a bibliophilic curiosity.

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Reference has several times been made to the 180 incunabula in the McGill libraries - more than 30 of them of special interest to Zoologists. It is not the purpose of the Compiler to mention all the rarissima among them, but attention may be drawn to the latter; several interesting items will be found in the recent annotated Catalogue under the headings Rabanus Maurus, Aristotle and Plinius Secundus. Attention is directed there to an early 14th MS. of Aristotle's Historia animalium, to the first printed edition of Pliny and to a copy of the 1472 edition once owned by William Morris whose own beautiful typography was in all probability influenced by the printed pages of Jenson's Venetian publication. ~~The important works of Bartholomaeus Anglicus issued in the fourteenth century are unusually well represented in the McGill collections, especially by a very fine copy in the Blacker Library of the De Proprietatibus Rerum, second Cologne edition, 1481, printed by Caxton just previous to the establishment of his own press. It is rubricated throughout and bound by Riviere in his best style.~~

Even rarer than the foregoing (possibly unique) is the 1508 (second) edition, printed in Venice, of Oppian's poem, Alieutikon. This rarissima is not noted by Brunet, by the Bibliotheca piscatoria or by any other catalogue accessible to the Compiler.

¶ Of titles of excessive rarity even when they appear in one or more catalogues the McGill libraries have their share. One of these is a fundamental treatise, Blasius Merrem's Beytraege zur besondern Geschichte der Vögel, in two parts, with 12 col. pl., 1784-6.

The long-established German dealer who supplied the volumes to the Blacker Library reports them as the first complete copy he had ever seen.

¶ The E. S. W. and Blacker libraries are fortunate in having been able to acquire several of the small ornithologic albums of the artist Flamen, whose copper-plate engravings of fauna are rare in all their states.

¶ A rare folio of 128 pp. in the E. S. W. Library is C. Ed. Blanchard's Recherches osteologiques, 1857, in which the osseous structures of birds are made the basis of a rational classification. This title is not listed in any of the usual catalogues.

628 b

¶ The treatise of Jan van de Straet, published at Antwerp in 1566 (Venationes ferarum) is one of the rarest of books on venery, including animal fights (bull baiting etc), for the delectation of the human brute; and similar perversions by man of the lower (?) animals. The excuse for the inclusion of the book in the library is not so much its rarity but because it does deal with a use of birds and beasts that occupied much human energy for several thousand years, including the present century; moreover it is remarkably well illustrated, furnishing excellent portraits of the animals in question. The Bleaker copy is unknown to the Nat. Hist. Cat. Br. Mus. ¶ The botanist Pierre Boitard in 1827 wrote a Manuel d'histoire naturelle in 2 vols. (Paris) which is not listed in any of the usual catalogues. The copy in the General library of McGill is the gift of Sir Donald Smith.

(R) Accademia della scienze di Torino.

1865-date. Atti.

1759-1838. Memorie. Series 1.

1839-date. Memorie. " 2.

Unica

628 c

(when complete)

¶ Another exceedingly rare and important treatise is Siebold's Fauna Japonica, 1834-8, which after several years quest the compiler was able to secure for the Blacker Library. Parts or single volumes of this well known monograph are met with now & then but the entire system is seldom on the market.

¶ A valued acquisition by the Blacker Library is a manuscript in the handwriting of (The famous naturalist) John Gould, in which he describes over six hundred birds, evidently a part of the original copy for some of his numerous published contributions.

Bibliotheca Historico-naturalis. (Leipzig). Continued as Bibliotheca Zoologica.

1700-1846.

628d

¶ Both the Blacker and the E.S.W. libraries possess several rare treasures in the shape of Zoological Bonapartiana.

¶ An interesting provenance is found in a presentation copy of Prince Charles Lucien's Revue critique, 1850, now in the E.S.W. Library and from the Godman collection. The Prince writes on the fly-leaf,

"To Mr. G. R. Gray, Ornithologist to the British Museum, London. This book is now sent for the third time. I hope it will reach [you] with all the others". The natural query is who "bagged" the other two?

¶ Another rare treasure is the fine Gurney library copy of Bonaparte's Iconographie des pigeons, 1857-8 with 55 colored plates complete.

Bombay Natural History Society.

1886-date. Journal.

628 a

¶ A rare tractate, not in the library of the British Museum (Nat. Hist.) but found in the Banks collection, is the Prosopopeia Animalium of Johannes Ursinus, published at Vienne in 1541.

¶ Probably issued in more than one printing is the very rare Traité élémentaire d'histoire naturelle of Martin Sainte-Ange and others, 1834-40. The Blacker Library has the four volume edition (48 livraisons), whose description the Compiler is unable to find in any of the usual catalogues.

¶ Eugenio Bettoni's Storia naturale, 1865-71, in three volumes is now among the great rarities in Zoological literature. Only 100 Subscription copies were issued (in 48 parts) of which one complete set is in McGill.

Bijdragen tot de Taal- en Volkenkunde Neerlandsch Indië. (The Hague).

1852-date.

unica
628f

¶ The Blacker Library ~~has~~ acquired a copy of the rare Balthasar Monconys' "Journal des voyages"; first edition, 1665-6. In this admirable history the adventurer describes the animal life encountered by him in his world-wide journeys.

¶ A ~~rare and useful~~ remarkable treatise is that of Stephenus A. Schoneveldе on North European ichthyology, with remarks on piscine nomenclature - a very scarce item.

¶ The McGill libraries have an ~~unusual~~ unusual collection of ~~G.~~ G.L. Buffon's famous works, but one deserves special mention here - an 1852 edition of the ~~books~~ birds of the Histoire naturelle, illustrated with 150 hand-colored plates, by two of Buffon's ~~associates~~ followers, A. Comte and Charles d'Orbigny. This very rare edition is not listed in any of the ushers catalogues. ~~This~~

Biological Bulletin. (Woods Hole, Mass:). 1898-date. Continues
Zoological Bulletin.

628 g

A complete (22 Hefte and 132 col. pl.) copy of Teutsche (not Deutsche) Ornithologie by Borkhausen and others, 1800–17, especially if accompanied by the original wrappers, is among the rarest of avian treatises. This scarce folio is in the E. S. W. Library.

In 1739 a Jesuit Father, Guillaume Bougeant, wrote a curious but interesting book on the psychology of the (?) lower animals, in which he anticipated by two centuries many modern theories, among them their possession of numerous human traits – especially among powers of speech. The work (now very rare) became immediately popular and was translated into English. Two editions are in the Blacker Library. This philosophic treatise, however, deeply offended the tender susceptibilities of the dominant church and Father Bougeant was promptly sent to prison for his temerity in promulgating doctrines unknown to that palladium of scientific progress, the Church of Rome, ecclesiastic Zoology. The Church gained a complete victory over its aberrant adherent. After thinking the matter over while in durance vile Bougeant decided to apologize for his indiscretion, did penance and once more reposed on the bosom of an infallible hierarchy.

Naturwissenschaftliche Gesellschaft "Isis" zu Dresden. See
Allgemeine Deutsche Naturhistorische Zeitung.

Aus der Natur. (Leipzig). 1852-1875.

Mart. Polyb. Lexikon
II 32 + 33 Bd. 1-15

4

629

Sep 57 80
fully read

B STUDENT'S AND LIBRARIAN'S READY

INDEX TO SHORT AUTHOR-TITLES ON

VERTEBRATE ZOOLOGY ARRANGED GEO-

GRAPHICALLY AND IN CHRONOLOGIC ORDER.

Bold-face 12pt. caps.

(use heading names from Sec.)

Lord. exh. 11/13 Wide spectrum

This classified list is intended to furnish a ready reference to the more important printed books, codices, atlases, etc in the various sub-divisions of vertebrate zoology. As a rule only one title (presumably the most important) is given from the list of publications (including reprints and editions) of a particular author on a particular subject. Other publications, if any, in the McGill collections will be found under the author's name in the appended Catalogue.

The main purpose of this Index is to enable those unacquainted with the bibliography of Vertebrate Zoology to find in a few minutes the title of a work whose identity no catalogue reveals and which might easily escape the notice of any but a specially informed librarian. Owing to its classified arrangement it ought to be of distinct assistance to students and librarians generally.

The Introduction mentions and the Catalogue lists and annotates most of the hundred or more titles of State, Provincial, County and other monographs on the local vertebrate fauna of Great Britain, Germany and America; but the student is also referred to other sources for information because lack of space prevents the entry of many of these titles in this Index. The same rule applies to the large body of serials and periodicals; these headings will be found in the Catalogue proper.

¶ As a concrete example of the ~~purpose~~ working of the Student's Index, let us suppose that it is desired to find a modern book on the Birds of British Guiana. The titles most likely to furnish full information on the subject are (geographically) to be sought, first, under General Treatises on ~~Animals~~ Animals of the World. The Index Indicum furnishes the page for that and other captions, and we find a recent treatise (in English) that will probably yield some of the required information, 1897. Lydekker's Natural History. Then we search for a history of Birds in General and soon find 1907, Knowlton and Ridgway. Next we turn to the Birds of the Americas and find 1918, Cory and Hellmayr. The list of books on the Vertebrate Zoology of South America follows ~~from~~ in the work, 1904, Eugène André's Guiana. Finally we look up the titles under the heading Birds of South America, from which we choose the specific title Birds of British Guiana, a well- known treatise, 1912-17, Charles Chubb. Armed with these books a complete account of the subject is at once available.

cente

How to find information regarding unusual titles in vertebrate zoology.

If the treatise sought cannot readily be traced in this Student's ~~Card Catalog Index~~ - because it is not in the McGill Libraries - the following method of search will be found useful.

It not infrequently happens to both the advanced student and the librarian that difficulties arise in locating the proper title of a book, an atlas, a manuscript, a periodical, or other item in the literature of zoology preparatory to consulting the work itself.

The main difficulty (in this quest) lies, as a rule, in the possession of an incomplete or imperfect heading. It is like searching for a person residing in New York or London, whose name is improperly spelled or the number of whose street is inaccurately given. It is as if one seeks John Smith, 2073 Bayview Street, when Henry Smith, 1073 Rayview Avenue is ~~where he really lives~~ the correct address. Then again, an extract from or a separate of a paper in some obscure journal masquerades and is not uncommonly advertised as a distinct publication; or a perfectly legitimate serial with its own pagination is everywhere described like (to give one of many such examples ~~titles~~) ~~the~~ North American Fauna. It would need a literary divining rod to discover it as quoted in most catalogues (unless it be several times cross-referenced where it is listed) ~~except~~ under United States - Department of Agriculture - Biological Survey Division - North American Fauna, 1889-date. In the appended Catalogue such misleading titles are cross-referenced to the caption under which they are most widely known.

There are many other stumbling blocks to be leaped or pushed aside before a hidden title is run to earth but these two obstructions will serve to illustrate the point. ¶ To continue, ~~[illegible]~~ in nine cases out of ten a reference to our best authority, the six (so far published) volumes, alphabetically arranged, of the Catalogue of the British Museum (Natural History) will afford at once the required information. Failing that source, the item must be rare or the title in some respect inaccurate, in which case Mr. H.W.England of the British Museum (Natural History) Library suggests (and the Compiler quite agrees) that further search may be made as follows :- If the date of issue be comparatively recent, i.e. between 1864 and 1930 the Zoological Record with its continuations should next be consulted. If no trace is there discovered, try that painstaking source of knowledge, the Bibliotheca Historico-Naturalis of Wilhelm Engelmann (and his subsequent coadjutors J.V.Carus and O. Taschenberg) that pretty well covers the whole range of literary vertebrate (and other) zoology from 1700-1930.

There are several original (confirmatory and other) sources of information for books etc published before 1700, incunabula etc; e.g. ~~the~~ the catalogues of Hain and Brunet; for titles appearing between 1836 and 1930 the supplements to the Archiv f. Naturgeschichte; between 1878 and 1930, the Zoologischer Anzeiger.

4.

These investigations made and the title sought still eludes the investigator, the research student is justified in declaring either that his first-hand description of the title is insufficient or inaccurate, that the work is an excerpt from some obscure item, or that he is the lucky possessor of a "unica aut zoologica rarissima", not recognised by the usual courts of record.

Although a few periodicals on the various sections of vertebrate zoology are included in this list it is by the Compiler considered desirable to speak of the most important of them in a special chapter, to which the student is referred. The Catalogue will be found to be well provided with such titles in all the scientific languages. As a rule only one (usually the first) edition of a work is quoted; other printings are generally to be found and evaluated in the appended Catalogue.

The following abbreviations are employed in this Index :- (Anat.) = Anatomy; (Aust.) = Australia, Australasia; (Batr.) = Batrachians, Amphibia; (Belg.) = Belgium; (Bib.) = Bibliographic or Biographic work; (Austria.) = the former Austrian Empire; (Can.) = Canada; (Cat.) = Catalogue list; (Class.) = classification, nomenclature, generic or specific lists; (Comp. Zool.) = comparative zoology; (Den.) = Denmark; (Dict.) = dictionary, encyclopedia; (Dist.) = geographic distribution, zoogeography; (Evol.) = evolution, Darwinism; (ext.) = separate or extract;

(G.B.) = Great Britain; (Geog.) = geographic distribution; (Ger.) = Germany, Middle Europe; (Holl.) = Holland, the Netherlands; (Hung.) = Hungary; (It.) = Italy; (Mass.) = Massachusetts; (Mus.) = Museum collections; (Neur.) = neurology; (N.Z.) = New Zealand; (Ont.) = Province of Ontario, Canada; (Öol.) = Öology, nests and eggs; (Oph.) = ophthalmology; (Paleon.) = paleontology, fossils, extinct species; (Per. or Period.) = periodical or serial; (Polyn.) = Polynesia; (Pop.) = popular; (Phych.) = phychology, animal behaviour; (Que.) = Province of Quebec, Canada; (Russ.) = Russian Empire; (Scand.) = Scandinavia; (Seneg.) = Senegambia; (Text-b.) = textbook, college manual; (Tr.) = travels; (U.S.A.) = United States; (Voy.) = Voyages, expeditions, travels.

Manuscript

Introductum

